Southern Pacific Railroad Natron Cutoff
(Southern Pacific Natron Extension)
(Southern Pacific Cascade Route)
From Black Butte, California, to Natron, Oregon
Black Butte
Siskiyou County
California

HAER No. CA-217

~~PHOTOGRAPHS~~

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
San Francisco, California

HAER
CAL
47-BBUT,
1-

HISTORIC AMERICAN ENGINEERING RECORD

SOUTHERN PACIFIC RAILROAD NATRON CUTOFF
(Southern Pacific Natron Extension)
(Southern Pacific Cascade Route)

HAER No. CA-217

Location:

From Black Butte, Siskiyou County, California to Natron, Lane County, Oregon, passing through Hotlum, Siskiyou County; Andesite, Siskiyou County; Grass Lake, Siskiyou County; Erickson, Siskiyou County; Penoyar, Siskiyou County; Bray, Siskiyou County; Kegg, Siskiyou County; Mt. Hebron, Siskiyou County; Macdoel, Siskiyou County; Dorris, Siskiyou County; the California/Oregon border near Dorris, California; Worden, Klamath County; Midland, Klamath County; Klamath Falls, Klamath County, Wocus, Klamath County; Algoma, Klamath County; Modoc Point, Klamath County; Lobert Junction, Klamath County; Chiloquin, Klamath County; Calimus, Klamath County; Kirk, Klamath County; Fuego, Klamath County; Chinchalo, Klamath County; Lenz, Klamath County; Mazama, Klamath County; Yamsay, Klamath County; Chemult, Klamath County; Gilchrist Junction, Klamath County; Mowich, Klamath County; Umli, Klamath County; Crescent Lake, Klamath County; Cascade Summit, Lane County; Abernethy, Lane County; Cruzette, Lane County; Frazier, Lane County; Fields; Lane County; Wicopee, Lane County; Heather, Lane County; McCredie Springs, Lane County; Pryor, Lane County; Oakridge, Lane County; Westfir, Lane County; Lookout, Lane County; Hampton, Lane County; Crale, Lane County; Dexter, Lane County; Minnow, Lane County; Jasper, Lane County; and Natron, Lane County.

NOTE: All UTM references are given for station locations, siding locations, principal grade crossings, or specifically indicated geological features.

UTM: 10-553600-4582540
Quad: Hotlum, Calif., 7.5', Provisional Edition 1986
(Black Butte)

UTM: 10-557390-4591850
Quad: Hotlum, Calif., 7.5', Provisional Edition 1986
(Hotlum)

UTM: 10-565845-4598310
Quad: The Whaleback, Calif., 7.5', Provisional Edition 1986
(Andesite)

UTM: 10-567985-4609690
Quad: Grass Lake, Calif., 7.5', Provisional Edition 1986
(Grass Lake)

UTM: 10-574085-4611030
Quad: Penoyar, Calif., 7.5', Provisional Edition 1986
(Erickson)

UTM: 10-578780-4612660
Quad: Penoyar, Calif., 7.5', Provisional Edition 1986
(Penoyar)

UTM: 10-586000-4610735
Quad: Bray, Calif., 7.5', Provisional Edition 1988
(Bray)

UTM: 10-584405-4615880
Quad: Bray, Calif., 7.5', Provisional Edition 1988
(Kegg)

UTM: 10-583115-4626830
Quad: Sheep Mountain, Calif., 7.5', Provisional Edition 1985
(Mt. Hebron)

UTM: 10-582890-4630910
Quad: Macdoel, Calif., 7.5', Provisional Edition 1985
(Macdoel)

UTM: 10-589940-4646260
Quad: Dorris, Calif., 7.5', Provisional Edition 1985
(Dorris)

UTM: 10-591940-4650540
Quad: Dorris, Calif., 7.5', Provisional Edition 1985.
(California-Oregon Border)

UTM: 10-593930-4655500
Quad: Worden, Oreg.-Calif., 7.5', Provisional Edition, 1986
(Worden)

UTM: 10-597475-4665000
Quad: Klamath Falls, Oreg., 7.5', Provisional Edition 1985
(Midland)

UTM: 10-601450-4675340
Quad: Klamath Falls, Oreg., 7.5', Provisional Edition 1985
(Klamath Falls)

UTM: 10-597690-4680760
Quad: Wocus, Oreg., 7.5', Provisional Edition 1985
(Wocus)

UTM: 10-596370-4688000
Quad: Wocus, Oreg., 7.5', Provisional Edition 1985
(Algoma)

UTM: 10-593160-4699560
Quad: Modoc Point, Oreg., 7.5', Provisional Edition, 1985
(Modoc Point)

UTM: 10-591865-4708200
Quad: Agency Lake, Oreg., 7.5', Provisional Edition, 1985
(Lobert Junction)

UTM: 10-593340-4714255
Quad: Chiloquin, Oreg., 7.5', Provisional Edition 1988
(Chiloquin)

UTM: 10-596880-4726000
Quad: Soloman Butte, Oreg., 7.5', Provisional Edition 1988
(Calimus)

UTM: 10-596050-4733200
Quad: Soloman Butte, Oreg., 7.5', Provisional Edition 1988
(Kirk)

UTM: 10-596105-4740625
Quad: Fuego, Oreg., 7.5', Provisional Edition 1988
(Fuego)

UTM: 10-596605-4746450
Quad: Fuego, Oreg., 7.5', Provisional Edition 1988
(Chinchalo)

UTM: 10-596540-4754330
Quad: Lenz, Oreg., 7.5', Provisional Edition 1988
(Lenz)

UTM: 10-596940-4762110
Quad: Mazama, Oreg., 7.5', 1967
(Mazama)

UTM: 10-597280-4768480
Quad: Mazama, Oreg., 7.5', 1967
(Yamsay)

UTM: 10-598250-4777460
Quad: Chemult, Oreg., 7.5', 1967
(Diamond Lake)

UTM: 10-590280-4785375
Quad: Chemult, Oreg., 7.5', 1967
(Chemult)

UTM: 10-596380-4801240
Quad: Muttonchop Butte, Oreg., 7.5', 1967
(Gilchrist Junction)

UTM: 10-594720-4802610
Quad: Muttonchop Butte, Oreg., 7.5', 1967
(Mowich)

UTM: 10-585040-4810930
Quad: Crescent Lake, Oreg., 7.5', 1967 (photorevised 1981)
(Umli)

UTM: 10-583510-4817700
Quad: Odell Lake, Oreg., 7.5', 1963 (photorevised 1981)
(Crescent Lake)

UTM: 10-577560-4825320
Quad: Willamette Pass, Oreg., 7.5', Provisional Edition 1986
(Cascadc Summit)

UTM: 10-572575-4828760
Quad: Willamette Pass, Oreg., 7.5', Provisional Edition 1986
(Abernethy)

UTM: 10-566090-4830770
Quad: Mt. David Douglas, Oreg., 7.5', Provisional Edition 1980
(Cruzatte)
UTM: 10-560640-4835365
Quad: Mt. David Douglas, Oreg., 7.5', Provisional Edition 1980
(Frazier)

UTM: 10-556350-4836470
Quad: McCredie Springs, Oreg., 7.5', Provisional Edition 1986
(Fields)

UTM: 10-560180-4835120
Quad: McCredie Springs, Oreg., 7.5', Provisional Edition 1986
(Wicopee)

UTM: 10-562450-4834260
Quad: Mt. David Douglas, Oreg., 7.5', Provisional Edition 1980
(Heather)

UTM: 10-557365-4839750
Quad: McCredie Springs, Oreg., 7.5', Provisional Edition 1986
(McCredie Springs)

UTM: 10-547605-4842270
Quad: Oakridge, Oreg., 7.5', Provisional Edition 1986
(Pryor)

UTM: 10-543335-4843650
Quad: Oakridge, Oreg., 7.5', Provisional Edition 1986
(Oakridge)

UTM: 10-541200-4845125
Quad: Westfir East, Oreg., 7.5', Provisional Edition 1986
(Westfir)

UTM: 10-538500-4847190
Quad: Westfir West, Oreg., 7.5', Provisional Edition 1986
(Lookout)

UTM: 10-532130-4851790
Quad: Westfir West, Oreg., 7.5', Provisional Edition 1986
(Hampton)

UTM: 10-528000-4855070
Quad: Mount June, Oreg., 7.5', Provisional Edition 1986
(Crale)

UTM: 10-516000-4861680
Quad: Lowell, Oreg., 7.5', Provisional Edition 1986
(Dexter)

UTM: 10-521000-4860460
Quad: Fall Creek Lake, Oreg., 7.5', Provisional Edition, 1986
(Minnow)

UTM: 10-508040-4871040
Quad: Jasper, Oreg., 7.5', Provisional Edition, 1986 (Jasper)

UTM: 10-506290-4873650
Quad: Springfield, Oreg., 7.5', 1967 (photorevised 1986) (Natron)

Date of Construction: 1905-1927.

Engineer: Southern Pacific Railroad Engineering Department.

Present Owner: Union Pacific Railroad, 1416 Dodge Street, Omaha NE 68101

Present Use: Railroad.

Significance: The Southern Pacific Railroad Natron Cutoff between Black Butte, California and Natron, Oregon was one of a series of major rebuildings and realignments of the original Central Pacific Railroad. Begun in 1905 under the direction of railroad magnate E.H. Harriman to replace the original Central Pacific route over the Siskiyou Mountains into Oregon, the Natron Cutoff had to overcome both natural and political obstacles. Stalled by government anti-trust lawsuits against Harriman, by World War I and the ensuing federal takeover of the nation's railroads, the Natron Cutoff finally overcame the rugged Cascade Mountains of Oregon to reach completion in 1927, at an ultimate cost of nearly $40 million. For the purpose of the current project, the Natron Cutoff was found likely to be eligible for the National Register of Historic Places at the state level of significance under Criterion A for its significance in engineering, transportation history, and the economic history of central Oregon, and in the development of the West, and under criterion B for its association with E.H. Harriman. The Natron Cutoff's period of significance is 1905 to 1945, from the beginning of construction in 1905, through the years of its role in the economic development of the central Oregon, to the conclusion of the railroad's achievements in World War II.

Report Prepared By: John W. Snyder
Co-Principal
P.S. Preservation Services
P.O. Box 191275
Sacramento CA 95819

I. DESCRIPTION

Presently owned and operated by the Union Pacific Railroad, the former Southern Pacific Railroad Natron Cutoff is a standard-gauge (four feet, eight and one-half inches between raitheads) railroad extending between Black Butte, California and Natron, Oregon.

It is a single-track line with passing sidings, with shops, freight yards, locomotive servicing facilities, depots, and appurtenant structures, including bridges, tunnels, and rock sheds, along the route. A comprehensive inventory of all contributive elements is beyond the scope of this documentation, which is aimed at recording certain of the tunnels. The Natron Cutoff has changed little in the seventy years since its completion. Routine rail and tie replacements have taken place, but in general the alignment, technology, and setting of the line remain virtually unchanged. A minor realignment of a short portion of the line in Oregon due to damming of the Williamette River and inundation of the original alignment eliminated a number of sidings between Lookout and Jasper, though a short stub of the original line remains below the dam between Hills and Fall Creek. A tunnel near Westfir has been bypassed and abandoned in place due to long-term slippage of the hillside above it. Beyond the alignment and roadbed of the line, contributive elements of this property include: tunnels; rock sheds; truss, deck girder, steel trestle, timber pile trestle, and concrete bridges; "searchlight" type automatic block signals and signal bridges; depots, section houses, and other support structures; locomotive servicing facilities; water tanks; the abandoned tunnel near Westfir; and the segment of original line between Hills and Fall Creek Station.

The present owner operates the railroad as a freight railroad, but AMTRAK provides passenger service over the line, with its *Coast Starlight* linking Los Angeles, California and Seattle, Washington.

II. HISTORY

In 1880 Southern Pacific Assistant Engineer, William Hood made a preliminary survey of routes through Oregon to reach Portland. The Central Pacific was building north through California toward the Oregon border and a meeting with the Oregon & California Railroad which was building south from Portland. One of the routes studied by Hood led through Klamath Falls and central Oregon, and because of obvious gradient advantages was the route of choice to C.P. magnate, C.P. Huntington. Unfortunately, by this time the Oregon & California Railroad was already south of Roseburg, and the Central Pacific found itself locked into a route that had to climb steeply through the Siskiyou Mountains to effect a meeting with the Oregon road at Ashland. Thus the railroad through the Siskiyous became the first route to Portland from California. The railroad, however, never lost sight of the advantages offered by an alignment through central Oregon.

In 1900 Collis P. Huntington, last survivor of the Big Four, died, closing a period of penurious management of the railroad that had seen the physical plant decline under lack of maintenance or improvement. Edward Henry Harriman had assumed chairmanship of the Union Pacific by May 1898, bringing an end to years of failures and receiverships. Under Harriman control, the Union Pacific board spent approximately twenty-five million dollars to rehabilitate the railroad, acquired the Oregon Railroad & Navigation Company, and re-acquired the Oregon Short Line, increasing Union Pacific mileage from 2,848 to 5,391

miles. Harriman had also early on recognized the value of the Southern Pacific and had tried continually to convince Huntington to sell him his interest. Huntington resisted until his death, at which time his interests passed to his wife and nephew, Henry. Harriman had previously ordered the Union Pacific to buy Southern Pacific stock, but he still needed the stock Huntington had left his family in order to take control of the Southern Pacific. Finally, in 1901, Edwin Hawley, who had been a close business associate of Huntington, endorsed the sale of Southern Pacific stock to the Union Pacific and vowed to sell his own. Acquiring just 38 percent of Southern Pacific stock, Harriman was thus able to gain control of the Southern Pacific, and eventually increased Union Pacific's holdings of Southern Pacific stock to forty-six percent.

Harriman succeeded Huntington as President of the Southern Pacific in September 1901. The merger had given Harriman and the Union Pacific control of 9,500 miles of railroad between New Orleans and San Francisco (the Southern Pacific Sunset Route) and between San Francisco and Ogden (the Southern Pacific Overland Route), and a virtual gridiron of lines in California and Texas. Harriman, with an eye toward increasing the profitability of his new acquisition, immediately initiated a system-wide program of improvement and modernization of the Southern Pacific and its equipment. These efforts, budgeted at between $30 million and $40 million, included:

> Initiating construction of the Natron Cutoff in Northern California and Southern Oregon to replace the arduous line over the Siskiyou Mountains, and including enlarging shops at Dunsmuir, California;
>
> Double-tracking the original Central Pacific line over the Sierra and bypassing or enlarging original tunnels to improve alignments and allow the use of larger modern locomotives and cars. Harriman contemplated electrifying the Sierra line (this never progressed beyond the planning stage), and planned the Summit Tunnel that was not to be built until 16 years after his death;
>
> Lengthening sidings over the Sierra, allowing the dispatching of longer trains. Half of the sidings were inside the 30 miles of snowsheds that largely enclosed the railroad between Blue Cañon and Truckee; extending the snowsheds required seven million board feet of lumber;
>
> Centralization and expansion of new shop and yard facilities in Roseville, California and Sparks, Nevada, largely replacing the more numerous smaller shops along the early transcontinental line, and expansion of Pacific Fruit Express icing facilities system-wide;
>
> Replacement of early bridges system-wide with modern, standardized designs;
>
> Installation of automatic block signal systems for faster, safer dispatching of trains;
>
> Building of the Lucin Cutoff across the Great Salt Lake in Utah to eliminate the circuitous route along the north shore of the Lake;

Construction of the Bay Shore Cutoff, whose tunnels and double-track main line between San Francisco and San Bruno shortened both distance and operating times between San Francisco and San Jose;

Construction of the Dumbarton Cutoff across the south end of San Francisco Bay;

Extension, in a joint effort with the Santa Fe, of the Northwestern Pacific Railroad from Willits to Eureka, California;

Construction of powerhouses and electrification of suburban commuter lines in the Oakland area, with the intention of electrification of all main lines around San Francisco Bay (this latter never occurred);

Controlling, after the efforts of all others had failed, a break in the banks of the Colorado River that threatened to permanently inundate the Imperial Valley in California;

Building of a new headquarters office building, and massive company hospital, in San Francisco;

Purchasing or building modern, heavier locomotives, heavy articulated locomotives purchased specifically to conquer the grades of Donner Summit;

Construction of new steel passenger cars in the company's own Sacramento Shops;

Construction of large new depots, and remodeling and modernization of older depots, system-wide, many in California in the Mission Revival style to symbolize the state and promote tourism;

Promotion of colonization of Southern Pacific owned or served irrigated lands in Arizona, California, and Oregon;

Construction of new lines into Mexico, and extension of existing lines within Mexico;

Standardization of everything from track spikes to locomotives among the many railroads under his ownership or direct control.

In a contrast to the penny-pinching years under Huntington's control, Harriman pledged to spend whatever money necessary achieve the full potential of the Southern Pacific lines. Studying the Siskiyou route, Harriman almost immediately recognized that it posed too many difficulties to offer a reasonable chance for modernization. The central Oregon option reappeared for consideration.

Harriman learned that the Weed Lumber Company had built a logging railroad from Weed to Grass Lake, roughly following the alignment of Hood's 1880 survey toward Klamath Falls. In a quiet deal reportedly completed at the Palace Hotel in San Francisco, Southern

Pacific acquired the interests in the lumber railroad on July 29, 1905. Carefully keeping Southern Pacific involvement quiet, Harriman capitalized his new acquisition at $5.4 million as the California Northeastern Railroad Company and appointed construction engineer, H.P. Hocy to carry construction through to Klamath Falls.

In the latter half of 1905, Oregon newspapers reported that the Southern Pacific had crews in the field surveying the Oregon Eastern Railway, a new line from Natron--south and east of Eugene--toward eastern Oregon. William Reid and a syndicate of English capitalists incorporated the Oregonian Railway, Ltd. in England in 1880 and had built a 94-mile line south from Woodburn to Natron as a narrow-gauge railroad. Southern Pacific purchased this line in 1890 and standard-gauged it; this would serve as the north end of what would ultimately come to be known as the Natron Cutoff. Somewhat presciently, the *Eugene Weekly Guard* opined that the new route would in fact be pushed south through the Cascade Mountains toward Klamath Falls and a meeting with the California Northeastern. Proof of Harriman's security, the newspaper reported that an unnamed syndicate had acquired the lumber railroad and was pushing it through to Klamath Falls.

According to the *Guard*, this new line extending from Natron to connect with the California Northeastern would become the Southern Pacific main line through Oregon, eliminating the existing main line's arduous climb through the Siskiyou Mountains into Ashland. Once completed, the paper reported, the new main line would handle all the heavy through trains between California and Portland, and the old main line would be reduced to carrying local trains. Though the new alignment might be 100 miles longer than the existing main line, its projected easier grades--a maximum of two percent as opposed to the old line's four percent--would allow for faster schedules and expedited service. A direct comparison of the two lines at the inception of the project revealed that the new line would have 12,865 degrees less curvature, 2,268 feet less vertical rise northward, 2,255 feet less vertical rise southward, and a maximum grade of 1.5 percent as opposed to 3.3 percent. The distance saved in curvature and vertical rise calculated to more than twenty-eight miles! Locomotives would be able to haul trains twice as heavy on the new line. In addition, the Natron Cutoff would open new lands to development, always a large consideration in the corporate mind of the Southern Pacific.

In mid-December James P. O'Brien, Vice President and General Manager of all the Harriman lines in Oregon (Southern Pacific, Union Pacific, Oregon Short Line), confirmed the earlier reports, announcing that Harriman had appropriated $4.2 million for the effort:

> The appropriation is to build an extension of the Southern Pacific line from Natron to a point east of the Cascade range and ending just east of the Walker range. Two surveying crews are now at work on the route, the money for building the road is ready and construction work will begin as soon as the surveyors finish their part. The new line will be built as the Oregon Eastern, and it will be 152 miles long. It will probably follow the McKenzie fork of the Willamette. The question of route has not been settled and will not be decided until the work of the surveyors is done.

C.R. Rankin was the engineer in charge of the survey. In January 1906 he returned from the preliminary survey to begin the permanent survey from Natron, leading to speculation that actual construction work would begin shortly thereafter. Rankin leased a home at Jasper as his headquarters even as his survey crews were still in the field near the

headwaters of the North Fork of the Willamette River, where they had found a seemingly good route and grades that would take the new line over the summit near Odell Lake. Rankin, however, made it clear that this was still a preliminary survey and that if a better route were found once the permanent survey had begun, then it would be selected instead. Informants on the railroad told newsmen that construction would begin that Spring, and that initial construction along the bluffs of the Willamette River would be both costly and slow.

By late January, Rankin's crews had returned to camp at Jasper, telling reporters that they would return to the field in a few days to begin the permanent survey, setting the grade stakes and handling all work preparatory for construction. Schedules called for grading and tracklaying to begin as soon as the winter rains ceased; the new railroad would be built as the Oregon Eastern. By March 1906 the permanent survey had progressed thirty miles east from Natron, at which point it entered the mountains and progress slowed accordingly. The rains stayed late that year, and it was mid-May before the grading contracts were finally let. The Southern Pacific was also trying to construct another line--the Oregon Western--from Eugene to Coos Bay, and its forces were stretched somewhat thin. With July, however, came news that the Great Northern Railway was also eyeing a route through eastern Oregon into Northern California, and Harriman marshaled all available forces to push the Natron Cutoff (as the Oregon Eastern was variously called). Harriman was determined to forestall the competition at all costs, and to that end he gave priority to the Oregon Eastern over all other Southern Pacific construction work in Oregon. By late July, Rankin had a force of sixty surveyors camped on the Hebert Ranch on the upper Willamette River, sixty miles east of Eugene; eight more arrived at Eugene on July 25 and immediately set out to join the larger party. Even this large group was, the papers reported, just a small portion of the army of engineers that Harriman had in the field, trying out every conceivable route and pass, and following up the preliminary survey by setting grade stakes for the adopted alignment.

The surveyors had selected an alignment following the Willamette River, to cross the Cascades near Crescent Lake. From there it would follow one of two routes surveyed over the summit to reach the east slopes. Once on the downslope the line was planned to branch, with one leg proceeding south to Klamath Falls and a junction with the California Northeastern, while the main line of the Oregon Eastern was to go east to meet a projected extension of the Oregon Short Line (another Harriman road) from the Snake River country [this latter leg of the Oregon Eastern was destined not to be built]. The railroad had still not let its construction contracts, but made it clear that the Oregon Eastern still had priority over the Eugene-Coos Bay line of the Oregon Western.

A month passed, and work had still not begun. However, a Harriman attorney from Portland arrived in Burns, Oregon on August 23, 1906 to formally file location maps for the Oregon Eastern's line through Central Oregon. From these maps reporters learned that the surveys were complete from Ontario to a point on Crane Creek near the east end of Malheur Lake; beyond that point the railroad still had not selected a final alignment. The only thing delaying construction, they reported, was a lack of adequate labor. At the same time, work on the California Northeastern's grade south from Klamath Falls began when forces moved a dredger into the marshes to open a thirty-foot wide channel to reach the proposed alignment. From there the dredge would build a grade across the marshes to the depot location.

The end of August 1906 brought a formal announcement from Southern Pacific that confirmed the *Guard*'s reports of some months earlier: the company owned and would extend the California Northeastern to meet the southward-building Natron Cutoff to form the new Southern Pacific main line in Oregon, bringing to an end decades of efforts to operate the Siskiyou line profitably. By this time the California Northeastern had completed forty miles of line north from Weed, with right of way secured all the way into Klamath Falls. The proposed new main line would extend 294 miles between Weed and Eugene. Southern Pacific optimistically announced its expectation to have the new line open for service in two years. The railroad also expected that completion of the Oregon Western to Coos Bay turn that port into a major shipping center, taking business from San Francisco. Both expectations were to be dashed.

In March 1907 the *Siskiyou News* reported a slowing of construction on the California Northeastern, attributed by the railroad to obstruction by land owners asking exorbitant prices, and by the land owners to a threatened rate war between the railroad and allied freight lines. Still, the railroad had a large force at work at Grass Lake with nearly five miles of line ready for tracklaying from there toward Klamath Falls, as well as a fine new depot building at Grass Lake. The railroad expected to have ten miles of line completed from Grass Lake by July, though much dredging work remained to be completed. By September the effects of the railroad's coming were making themselves known. Dorris, the site of which had been sagebrush flats two months previously, was growing by leaps and bounds, with dozens of businesses in place. The Bank of Dorris opened its doors, and boosters projected population to reach 400 by Christmas 1907. Further north, operators of the steamer *Klamath* on Klamath Lake were already making plans for direct connections with the oncoming railroad. What was boom to one site could mean bust to another, however, as the residents of Picard found when its Post Office moved to Dorris in September.

The railroad building remained big news in the area. Smoke from the steam shovel working at Mount Hebron could be seen from Dorris, and blasting every morning and noon reportedly sounded "like heavy artillery." Erickson and Petterson had a twenty-four horse grader at work twelve miles from Dorris, and a total of four hundred men and four hundred horses at work on the line. The contractors' biggest problem, however, was that of labor retention. Southern Pacific Chief Engineer, William Hood recognized the problem also, stating:

> The great trouble is to get men, and then to have men stay when you get them. They seem to be a roving class. If we could get men and they would stay at the work we could complete the road in less than a year, but how much longer it will take I do not pretend to know.

By December, though, the railroad and its contractors could report that the new depot at Bray Station, west of Dorris, was completed as were the stock yards which were ready to begin shipping stock. The California Northeastern could begin paying for itself.

In February 1908 the citizens of Dorris heard that tracklaying from Bray Station had begun and was expected to reach Dorris by May. The exodus from Picard continued, as George Otto arrived in Dorris with his story; Otto's large barn was on the move from Picard to Dorris, and Marion High moved his smaller buildings from Picard to Dorris. By this time, the railroad camp in Macdoel had also been moved to Dorris. By mid-year Mount Hebron

also had its new depot erected and ready "for the Southern Pacific regulation paint." And by year's end the citizens of Dorris voted to incorporate. Their town, grown from the sagebrush flats in less than a year because of the coming of the California Northeastern, by December 1908 had a population of six hundred, served by three general stores, a clothing store, grocery store, drug store, furniture store, confectionery and notions store, blacksmith shop, two barber shops, three hotels, a bank, lumber yard, two livery stables, billiard hall, opera house, eleven saloons, jail, doctor, two churches, and a newspaper.

Reaching Dorris on May 1, 1908, the railroad built a temporary line through Klamath Pass so that construction could continue northward while crews worked on driving Tunnel 1 (today Tunnel 17, HAER CA-) and Tunnel 2 (today Tunnel 18, HAER CA-) through the ridge. However, in April 1909 an employee of Erickson and Petterson, said to be "sore at the railroad" but more likely upset at the contractors for practices that will be discussed later, wrecked the north end of Tunnel 1 by setting off a case of powder. The resulting blast injured seven, killed a horse, and badly damaged a steam shovel some two hundred feet inside the tunnel. Fortunately, the machine broke the force of the blast and saved the lives of twenty-five workers. Fifty feet of timbering at the mouth of the tunnel was destroyed, and another 150 feet were so badly damaged as to require replacement. Concussion broke windows in nearby shops and saloons. Dorris Sheriff Hatch arrested one Frank Peterson after two of his fellow workers reported seeing him fire the charge. By July, however, things were back to normal and local papers reported that Southern Pacific had already purchased a depot site in Klamath Falls and built an expensive road to the site.

The following month the California Northeastern reached Klamath Falls. Virtually everyone in town turned out to greet the first train. Businesses and schools closed, the Klamath Military Band played, and 1,200 citizens were on hand at the depot. Rumors of a railroad for Klamath Falls (originally called Linkville) had begun as early as 1867; now it was finally a reality. The railroad's arrival set off a lumber boom of unprecedented proportions, as transportation became available to handle the vast stands of western white pine and sugar pine.

On the Oregon Eastern, however, the schedule had slipped badly. Crews of the Utah Construction Company, building south from Natron, were hard at work hauling supplies to their field crews. Freight wagons pulled by eight-horse teams hauled powder, feed, provisions, and everything else; by October 1909 it was clear to the teamsters that their work would continue through the winter. A twelve-horse team pulled a large stationary boiler up the line to supply steam to generators that would in turn power electric drills used in boring a 2,200-foot tunnel. While the company relied on horse-drawn equipment to handle supplies, they did have mechanized equipment in the form of steam shovels at work building the line. By late 1909 one was at work excavating a major cut near North Fork, while a second was at work a short distance beyond. Utah Construction also maintained its own doctor, W.L. Cheshire, at the construction scene.

The construction proved an economic boon to Natron, headquarters for the job. By October 1909 a Mr. Riley was back in town with $3,000 worth of furniture and carpets for the new hotel he was about to open. The railroad was building a large warehouse to store supplies. Builders were busy erecting new houses and apartments for railroad employees and employees of Utah Construction. Teamsters were bringing in supplies, lumber, hay and grain, trying to beat the onset of winter weather. A steam-powered saw was at work cutting a winter supply of wood. Papers reported that "[M]iller avenue in Natron is rapidly

building up with stores and residences. The population has increased over 300 per cent in this last two months..."

In the south, the California Northeastern closed the 22.69-mile gap from Dorris to reach Klamath Falls in May 1910. In the north the story was a bit different. Construction on the Oregon Eastern slowed appreciably during winter 1909-10, but the onset of better weather offered no respite from natural obstacles. In June 1910 a large landslide at Hull's Point, near Jasper, swept down to block the line; at three o'clock the next morning a multi-ton rock tumbled down at the same point to land squarely on one of Utah Construction's steam shovels, crushing it badly. Unfortunately, the only means open to the company to remove the rock was to blast it, which meant finishing demolition of the machine.

By this time, it was clear to the newspapers that the Natron Cutoff was but one element of a network of Southern Pacific projects begun under Harriman (who had died in 1909), most of which were being built by the same two construction firms: Utah Construction Company of Ogden, and Erickson and Petterson of San Francisco. Utah Construction had built the railroad's famed Lucin Cutoff across the north end of the Great Salt Lake in 1905, and Erickson and Petterson had built the California Northeastern to Klamath Falls. Both companies were at work on the double-tracking of the original Central Pacific over the Sierra Nevada, with the initial construction between Rocklin and Colfax, California. In addition, the San Francisco firm had the contract for the construction of the S.P.'s Alturas line down the east side of the Sierras between Fernley, Nevada and Klamath Falls, Oregon, where it would meet the Natron Cutoff.

On the south end of the project, daily freight trains were running in both directions on the California Northeastern by May 1910. On the north end, late 1910 brought a route change to the Natron Cutoff. Southern Pacific survey crews, still working ahead of the construction crews, had been in the vicinity of Odell Lake near the summit for nearly a month. There they had raised the grade of the line from ten to twelve feet above the initial survey, at the same time eliminating several difficult curves. Near the townsite of Wakefield, north of Crescent, they moved the line nearly a quarter mile west of the old survey. At the same time, Erickson and Petterson had reached and passed Klamath Falls and were moving their construction camps to a point north of that town. There they would begin construction of nine miles of railroad to terminate at the Klamath marsh. The contractors had a crew of nearly 500 men at work, and were looking to increase the number.

In November 1910 Utah Construction began removing its construction equipment from the Oregon Eastern. Carloads of equipment moved north on the Southern Pacific through Springfield, and newspapers reported that before three more months had passed there would not be a construction camp left on the whole line, except at one tunnel. All of the subcontractors were similarly poised to ship out, leaving thirty miles of new mainline stretched along the Willamette River. The reason for this change lay in the fact that Utah Construction was moving its crews southwest to Humboldt County, California, where the Southern Pacific and Santa Fe railroads had hired them to extend the jointly-owned Northwestern Pacific railroad between Willits and Eureka. Erickson and Petterson in turn had acquired the contract to build the Oregon Eastern through the gap between the marshes north of Klamath Falls and the end of track waiting thirty miles south of Natron. The following month, however, brought startling news.

In November 1910 the *Eugene Daily Guard* reported:

> It is understood from fairly reliable authority that the contract on the remaining distance of the Natron extension between here and Klamath Falls, which was recently let to the Erickson & Peterson [sic] company, has been thrown up by them. It is understood that the S.P. company, under the circumstances, will endeavor to construct this piece of road by themselves. There will be no big contract, but the whole will be sub-let. By this they think that they can save money. It is not known why the E. & P. Co. have given this up.

Erickson and Petterson had had earlier troubles on this job. On December 22, 1908 authorities arrested Gustav Petterson at Dorris on a charge of extortion. The firm, which had some 600 men at work on the California Northeastern, was working a scheme by which they paid their work force in "time checks"--checks drawn on a Portland, Oregon bank and dated one to two months hence. Then the company would ask the men if they wanted their money "now." Almost without exception the answer was, not surprisingly, in the affirmative. Erickson & Petterson then paid the men with checks that discounted their pay by ten percent for the privilege of available funds. The men often had to further discount the check when cashing them at local banks or businesses, largely because Erickson & Petterson had the reputation of holding up payment. The firm was reportedly profiting nearly three thousand dollars each month by this means, more than their profit on the construction contract (except for tunnel work). The firm also gouged its workers on prices for goods from its commissary department (from which the workers had little choice but to buy), and charged a monthly hospital fee while providing no sick care. The charge was ultimately reduced to a misdemeanor in order to avoid having to take Petterson to the distant county seat, and in order to settle the case and avoid construction delays. Did this ultimately cause the railroad to terminate the company's contract? The record is not clear, but the cause probably lay elsewhere. For if the contractors had their troubles, the railroad's were immeasurably greater by this time, and therein likely lay the Southern Pacific's decision to try to build the line themselves.

By this time the federal government's anti-trust suit against the Harriman lines was well underway. Still, the railroad persevered in the face of adversity and continued work on the Natron Cutoff. In December 1910 Julius Kruttschnitt, head of the traffic department of the Harriman lines and headquartered in Chicago, arrived in Eugene in the company of several other Southern Pacific officials. Kruttschnitt was on one of his regular inspection trips, and the party traveled out to Natron and beyond to the end of track. Following his inspection, Kruttschnitt traveled to Portland where he gave a statement remarkable for its optimism in a period when the Harriman lines' construction projects were beset by both natural and governmental obstacles. He stated that the Natron Cutoff would be complete by June 30, 1911, with running time between San Francisco and Portland reduced to twenty-two hours.

> We have completed 13 miles of track on the south end of the line above the falls and have 35 miles more ready for the rails. We also have men working at the north end and have completed six miles of the track, with 22 miles graded. This piece of road will be pushed to completion as rapidly as possible.

Kruttschnitt also spoke with discouragemcnt regarding the market for railroad securities, probably a direct reference to the government's anti-trust actions. He that until they could be made attractive again, it would be difficult to find much money for railroad developrncnt in the northwest. His optimism was not universally accepted, however. An editorial appeared in a Portland paper:

> The statement credited to Traffic Mgr. Kruttschnitt of the Southern Pacific Company, that trains would be running over the Natron extension to San Francisco by the end of the present fiscal year, is ridiculous....because it is doubtful if the present contracts can be completed in that time. Then there are at least 70 miles, or more, through the heart of the Cascade mountains, for which the contracts have not even been let. More rapid progress will have to be made...than in the past to insure the completion...of the cut-off in two years more.

Readers of the *Corvallis Gazette-Times* learned that Southern Pacific was building the extension with a nineteen foot-wide roadbed, laid with ninety-pound rails (railroad rail is measured in pounds per yard, thus the Natron Cutoff was being laid with rail weighing ninety pounds per yard, or 1,170 pounds per each standard thirty-nine foot rail), quite heavy track for the day. For the railroad to maintain their desired light grades required the boring of three tunnels ranging from 500 to 1500 feet in length in one run of eight miles. The railroad built a number of sawmills to supply timber for tunnel linings and for bridges; indeed, one sawmill built in advance of the railroad had a contract for nearly four million feet of lumber for bridges. Concrete also had a large role in the construction, as the bridges were supported on concrete piers, and the tunnels faced and lined with the same material.

Nearly a year passed, and in October 1911 the railroad let the contract for construction of depots along the line. Those at principal points were to be two-story structures (probably Southern Pacific Standard Plan 22) combination freight and passenger depots costing $5,100 each. W.L. Graff of San Francisco received the contract for depots at Natron, Jasper and Lowell. Train service seemed closer than before, at least as far as the line was completed. Indeed, newspapers quoted S.P. Vice-President and General Manager E.E. Calvin as stating that the Natron Cutoff would now be completed in early 1913, and that work would soon commence on the Oregon Western from Eugene to Coos Bay. Calvin, whose territorial responsibilities had just been expanded to include Oregon, was in Portland after an inspection trip of all the Oregon trackage.

> The Natron-Klamath work is going forward rapidly, he reported. Recent contracts on that project will provide activity until the end of the present fiscal year. Appropriations have been provided for completion of the entire cutoff and the construction will be authorized as rapidly as progress requires. 'I expect the Natron-Klamath line to be finished in a year and a half,' said Mr. Calvin. 'It may be done soon after the beginning of 1913.'

As seeming proof of his statements, Western Union linemen were busy stringing telegraph wires from Natron to the end of track in anticipation of completion of the contracted depots. In fact, the railroad had already been running a limited train service along the north end of the line, carrying both freight and passengers. Even though the service was anything but regular, it had already proved a boon to residents of the upper Willamette country. Plans were afoot to begin regular service with a train leaving the end of track early in the morning

to run to Eugene where it would lay over a few hours before returning to the terminus in the afternoon.

November 1911 found Utah Construction back on the job on the north end, placing steel for the big bridge over the North Fork of the Willamette River some forty miles out of Eugene. Rails had reached the west approach to the bridge. Now it seemed that although most of the work was completed, Utah Construction had in fact moved very little of its equipment away earlier, even though the company had large contracts in Idaho and California calling for the same type of machinery in use on the Natron Cutoff. The size of the project can be somewhat gauged by the fact that Utah Construction was holding over 200 mules at Natron.

The following month the railroad was hard at work building terminal facilities at Oakridge, at the south end of the Natron line. Carpenters, having finished the depots at Jasper and Lowell, arrived to build the Oakridge depot, and a 65,000 gallon water tank to serve the steam locomotives that would be stabled there. Crews had staked out two potential roundhouse sites and would begin construction as soon as the railroad determined which to use.

In the south, Southern Pacific's corporate maneuvering continued as the Oregon Eastern purchased the California Northeastern on December 18, 1911, bringing both elements of the Natron Cutoff under a short-lived single ownership.

Southern Pacific began 1912 in Oregon by increasing the capital stock of the Oregon Eastern from $1,000,000 to $6,000,000, and by letting another contract for construction of the next leg of the Natron Cutoff, leading to general jubilation on the part of area residents. With a 73-mile gap still existing, Utah Construction received the contract for eight more miles of line south from Hazeldell; completion of this section would leave forty miles of hard work to reach the summit of the Cascades. Papers reported inside information:

> There is yet forty miles to let before reaching the summit but the *News* has inside information that the contract for remaining 40 miles will be let immediately upon completing the new survey. This will complete the road east from Natron to Odell Lake, but there is still a gap of 25 from Odell to the other end of the road building this way. This short distance, however, is only a matter of small consideration as the entire distance is practically ready for the steel."

It began to appear that Vice-President Calvin's words might prove true. Utah Construction company began the clearing of about six miles of right-of-way above Oakridge, having shipped the equipment for the work from Natron to the "front." Depot construction crews had kept their equipment on hand at Natron during the winter anticipating a resumption of work on more buildings. Southern Pacific was attempting to rush work from both ends of the gap, and their resumption of work in January was an indication of the railroad's seriousness toward completing the line. True, there had been no firm word of letting of contracts at the Klamath end, but S.P. engineers were in Klamath Falls in force, so everyone assumed that construction would resume as soon as weather there permitted.

In mid-January 1912 Southern Pacific's head engineer at Eugene, H.P. Hoey, left for Klamath Falls to look over the work of Erickson and Petterson, by then back on the job.

Work had largely halted due to heavy snowfall that averaged four feet deep at the north end of the Klamath Falls line. Once the weather improved, Erickson and Petterson faced sixty miles of comparatively easy country, requiring little more than basic grading to build the railroad, though it would be several months before the railroad let the contract for that work.

On the Natron end of the extension, Utah Construction had already established several camps above Oakridge to push their work forward as quickly as possible. By late February 1912 they had a force of two hundred men clearing the right-of-way sufficiently to allow the company to bring up its steam shovels. This work proved difficult for several reasons. This was heavy timber country with no roads, requiring crews to build their own wagon roads in wet weather that made progress difficult. Nature struck back too at the portion of the railroad already completed. As the work train moved up the line from Oakridge late that month, a slide a mile above Pengra partially covered the tracks with earth and rocks, derailing the locomotive and two cars. A derrick and wrecking crew had to be brought from Portland to rerail the equipment and clear the line.

The end of February brought another corporate change, with the wholly S.P.-owned Central Pacific Railway purchasing the Natron Cutoff on February 29. If there had ever existed a doubt in anyone's mind regarding who was behind the overall project, that doubt had been forever laid to rest.

April 1912 brought another milestone, as D.W. Campbell, Superintendent of S.P.'s Oregon lines, arrived in Eugene in his private car. There an engine coupled on to take Campbell and several other officials up the new Natron Branch, as the north end of the extension was being called. Though he did not state the purpose of his visit, newspapers reported that he was making his final inspection of the line from Natron to Oakridge, prior to its formal acceptance, and trains would shortly be running regularly to Oakridge. The papers were correct, as S.P. initiated a new train from Coburg to Oakridge by the end of April. This gave Eugene almost a direct service to Oakridge, as well as to Jasper, Lowell and other intermediate points on the upper Willamette. Even though the new train did not run directly into Eugene, the railroad provided service to neighboring Springfield where Eugene patrons had simply to step across the platform from one train to the other. The service was a "mixed train," handling both freight and passenger cars in one train. Then, with completion of the line seemingly within the company's grasp, events overtook the project and brought a twelve-year hiatus.

Working under the provisions of the Hepburn Act of 1906, in January 1907 the Interstate Commerce Commission had begun to investigate the relations among the western railroads. On the basis of the evidence discovered, on February 1, 1908 the federal government filed a suit in equity in the United States Circuit Court, Eighth District, against the Union Pacific Railroad and its auxiliaries, as well as against the Southern Pacific Railroad, Northern Pacific Railroad, Great Northern Railway, the Atchison, Topeka and Santa Fe Railroad, the San Pedro, Los Angeles & Salt Lake Railway, the Farmers' Loan & Trust Company, Jacob H. Schiff, Otto Kahn, James Stillman, Henry H. Rogers, Henry C. Frick, William A. Clark and, not coincidentally, against Edward H. Harriman who had control of, interests in, or relationships with, all of the foregoing. Harriman, arguably the most significant American railroad empire builder of the early twentieth century, had set off perhaps the most major use of anti-trust legislation.

The government's basic allegation was that the individuals named conspired to effect a virtual consolidation of the Union Pacific and other transcontinental lines with the intent to unlawfully restrain transcontinental commerce. The government asked the court to find this conspiracy a violation of the Sherman Anti-Trust Act, and to "perpetually enjoin Union Pacific, and its auxiliaries from purchasing, acquiring, receiving, holding, voting, or in any manner acting as owner of any shares of the Southern Pacific, Northern Pacific, Great Northern, Atchison, or Salt Lake line." The government contended that under independent control, ten percent of the total Union Pacific and Southern Pacific traffic would be competitive. That ten percent, they pointed out, included California traffic.

In their turn the defendants argued that Union Pacific was not a competitor for California traffic. Lawyers for the railroad asserted that it its line to Portland and boats to San Francisco gave it no control over such traffic, pointing out that this route consumed several days more time than Southern Pacific routes, and could not operate at lower rates without prompting Southern Pacific to retaliate by turning a richer eastbound business over to Union Pacific's competitor Denver and Rio Grande at Ogden. For this reason, they stated, the Southern Pacific absolutely controlled California traffic before the merger. Surely, then, "purchase of a substantial holding of Southern Pacific stock by Union Pacific amounted, therefore, to mere advancement of Southern Pacific's gateway from Ogden to Omaha, and in no wise altered competitive conditions."

Initially, it appeared that the courts would uphold the merger. In early 1911, using the United States Supreme Court's "rule of reason," the Eighth Circuit Court found that the merger of the Union Pacific and the Southern Pacific did *not* violate the Sherman anti-trust law. The court concluded that the Union Pacific could not reach California without either building a new line or acquiring the Central Pacific (which by this time was wholly owned by the Southern Pacific) which had the line extending to San Francisco from its junction with the Union Pacific at Ogden, Utah. Since, the court reasoned, the acquisition of the Central Pacific could not be achieved without the acquisition of the Southern Pacific as a whole, the merger was allowable. The court found that the merger was chiefly one of connecting rather than competing lines. Though attorneys for the federal government brought out the fact that Union Pacific and Southern Pacific both reached Portland on their own rails and asserted that the merger would serve to stifle competition to and from Portland, and to and from San Francisco, the court found for the defense that competition between the two railroads for San Francisco was "largely mythical." It found that there was no increase of rates or deterioration of service evident due to the merger, and thus could not find that the merger was an "unreasonable' restraint of trade." The railroads had won the first battle, and the industry felt that the merger of the Harriman Lines was safe from dissolution. But this was but the first battle in what was to become a virtual war.

The federal government never faltered in the wake of this decision, and continued to press its suit through the court system. By 1913, trade journals reported a different story. Bowing to government pressure and legal reverses, the Union Pacific and Southern Pacific proposed to dissolve their merger, with each retaining a part of the Central Pacific. Union Pacific's possession of its portion of the transcontinental line would reach San Francisco and as far south as Fresno. Union Pacific also proposed to retain half of San Pedro, Los Angeles & Salt Lake, which would give it a line from Salt Lake to Los Angeles. Further, Union Pacific would retain control of both the Oregon Short Line and the Oregon-Washington Railroad & Navigation Company, by which it could reach throughout the Northwest, to Portland, Tacoma, Spokane, and Seattle. Southern Pacific, for its part,

would retain a 99-year lease to that portion of Central Pacific that constituted part of its line from Portland to San Francisco [this presumably included the Central Pacific-owned Natron Cutoff]. Southern Pacific would also enjoy trackage rights over Northern Pacific's line from Portland north to Puget Sound, and its steamship lines would ply between Los Angeles, San Francisco and the north Pacific coast. Union Pacific ultimately was denied any possession of the former Central Pacific when the so-called "unmerger" took place. Even this was not enough to satisfy the government, which then began to press to force the Southern Pacific to give up the Central Pacific. Other government suits sought to force the return to the government of lands granted to the Southern Pacific in Oregon and Washington, with the claim that Southern Pacific's timber, mineral, and land sales violated the terms of the grant.

The years continued to grind by as the suits wound their way through the court system. Then, in March 1917, the U.S. District Court of Utah decided in favor of the Southern Pacific, denying the government's petition to separate the Central Pacific from the Southern Pacific. In its decision the court opined that it was highly doubtful that the Sherman Anti-Trust Act could be applied to consolidations that had been formed prior to its passage, pointing out that consolidation of the Central Pacific and Southern Pacific had begun in 1870! The court also pointed out that there was no evidence that operation of the Central Pacific as part of the Southern Pacific had had any "injurious" effect on shippers. The court concluded that although the two constituent roads had separate corporate organizations, they had been built by the same interests, had always been operated as a single system, and both would be disastrously crippled if separated. A month later, however, the United States Supreme Court upheld a decision by the U.S. District Court of Oregon, enjoining Southern Pacific from selling timber and minerals from lands granted to the Oregon and California Railroad during its construction in the 1870s. The Supreme Court further found in favor of the forfeiture of two million acres of railroad land in Oregon and Washington to the government, providing for government sale of land, timber, and minerals.

In California, the Progressives under Hiram Johnson had taken office; they took up the question of railroad regulation, and undertook the task of "kicking the SP out of politics." Though the Southern Pacific continued to have great influence in the state, the early years of the twentieth century saw it lose the political dominance it had previously enjoyed. "The Octopus" was losing its all-encompassing grip.

Reeling from the cost of the Harriman improvements and the government-ordered dissolution, Southern Pacific saw its profits cut sharply first by the opening of the Panama Canal which cut shipping time between the coasts, and then by the outbreak of World War I in 1914; however wartime traffic and industry brought increased revenues. These were offset by increased traffic to the two sumptuous fairs held in California in 1915, the Panama-Pacific International Exposition in San Francisco, and the Panama-California Exposition in San Diego, as well as by the U.S. entry into the war in 1917. This latter, however, brought federal control of the nation's railroads under the United States Railroad Administration in late 1917 in order to coordinate the heavy wartime rail traffic.

Government control of the railroads was regionalized, with government-appointed administrators drawn from railroad management professionals in charge of each region. In the West, the Central Western Region came under the control of Southern Pacific President, William Sproule, appointed District Director of the lines west of Ogden, Salt Lake City, Albuquerque and El Paso, and south of Ashland, Oregon.

The end of the war did not bring an immediate end of government control, however. In fact the U.S.R.A. held control of the railroads until President Wilson finally announced in February 1920 that the railroads would revert to private control on March 1, 1920. When this occurred, Southern Pacific resumed its planned improvements system-wide, including the interrupted Natron Cutoff. The 1920s saw S.P. finally complete the Harriman-generated improvements on the Natron Cutoff, over Donner Summit and in the Tehachapi Mountains in the north and south of California respectively, further modernize its equipment, build new steamships to enlarge its fleet, and deal with the deferred maintenance of the U.S.R.A. years.

After finally prevailing against the federal government's unmerger suit in 1923, Southern Pacific laid out plans for major improvement projects throughout the system. These plans included completion of the Natron Cutoff, a project requiring closure of a 110-mile gap between Kirk and Oakridge in Oregon, and realignment of the southernmost portion of the former California Northeastern between Black Butte and Grass Lake to eliminate heavy grades on the former logging railroad (S.P. authorized this latter portion of the project, which also had the benefit of reducing mileage, in 1925). On September 1, 1923, with Chief Engineer of Construction, George W. Boschke in charge, construction resumed at Kirk.

Resumption of the project was cause for celebration in Oregon. On October 12 and 13, 1923, citizens of Klamath Falls celebrated the beginning of construction on the new line. Those invited included both the general public and the principal commercial organizations on the Pacific Coast. Typical of such celebrations of the day, there was a pageant outlining the creation of Crater Lake and the development of transportation from the early days of the territory, and a parade involving many local citizens. Southern Pacific used the event to promotional value, offering special fares for attendees while also taking pains to give them the opportunity to view the countryside (the Shasta Route had already been billed as one of the great scenic rail lines), as well as to note industrial possibilities in the new territory. One of the celebrants was Southern Pacific's Assistant Construction Engineer, H.P. Hoey, who had been on the project from the beginning; he was destined not to see its completion however, dying at Oakridge less than a year later.

Almost at once it appeared that the kick-off celebration might have been premature. Not only natural obstacles faced the railroad: regulatory intervention threatened to intervene once more. Shortly after construction resumed in 1923, the Oregon Public Service Commission filed suit and petitioned the Interstate Commerce Commission to force Southern Pacific to allow joint use of the Natron Cutoff by other railroads. The specter of a Great Northern Railway entrance into S.P. territory that had so concerned Harriman had returned. Southern Pacific slowed construction efforts, and at one point top company officials considered dropping the project entirely rather than share trackage rights. Negotiations with the regulators and with Great Northern and the Northern Pacific continued to drag out, until finally the I.C.C. announced its decision on May 3, 1926. The Commission threw out Oregon's petition and allowed S.P. acquisition of certain other lines, but also required joint usage by the Great Northern of the Natron Cutoff in order for the latter line to reach Klamath Falls. While all this was transpiring, construction had proceeded somewhat slowly as S.P. awaited the outcome.

From the $4.2 million originally budgeted by Harriman in 1905, cost of closing the 110-mile gap had now ballooned to $16 million. With another $4 million budgeted for each of

related projects to rehabilitate the Oakridge and Klamath Falls Branches completed during the initial construction, and to build the new line between Black Butte and Grass Lake in California, overall cost of the Natron Cutoff now stood at an estimated $28.2 million.

Southern Pacific let the grading contracts between September 1, 1923 and April 9, 1924, distributing the work among six firms: John Hampshire would be responsible for 36 miles; the ever-familiar Utah Construction Company of Ogden for 36.7 miles; Stewart & Welch of San Francisco and Seattle for 14.6 miles, including the Summit Tunnel; Ericson Peterson & Grier Company [perhaps successor to Erickson & Petterson?] for 9.7 miles; Henry & McFee for 5.3 miles; and Kelly & Sullivan for 5.4 miles. The difficulties facing Henry & McFee were typical of those on the north end.

On the south end near Kirk, builders found themselves on a table land between the Cascade and Walker mountain ranges. In this country, they rapidly pushed forward grading work, as there was only a 317-foot rise in sixty-seven miles. To avoid climbing to the 5,130 summit, there would be a 3,648-foot tunnel at the 4,842-foot elevation. Still, not all the construction was to be light. As this portion of the line moved into the Deschutes River watershed, it required numerous cuts and fills. One sixty-five foot deep cut required 119,000 cubic yards of excavation, seventy-five percent of which was rock, in a distance of 1,000 feet, while a 4,000 foot long cut some forty-five feet deep required the removal of 219,000 cubic yards of material. At Big Marsh Creek the builders had to create a seventy foot high fill requiring 187,000 cubic yards of earth.

It was on the north end of the project that the railroad's contractors faced truly difficult conditions. The forty-three miles from the Summit to Oakridge comprised mountainous, heavy timber country, requiring almost continuous side-hill grading and extensive tunneling. Descending from the Summit Tunnel the line would follow the south side of Salt Creek Canyon for nineteen miles until reaching the crest of Cougar Ridge, where it would make a 200° turn--much of which would be inside a 2,205-foot tunnel. Backtracking along the same ridge but at a lower elevation for eight miles the line would then make another sharp curve, crossing Salt Creek on a seventy foot-high, 515 foot-long steel viaduct to resume its progress north toward Oakridge. The sidehill construction was to prove difficult. As the graders pushed forward, unstable slopes forced line revisions and required the substitution of one 2,095-foot tunnel in place of three shorter tunnels originally planned at that location. Too, the absence of roads in the area meant that the contractors would have to build their own on which to bring up equipment.

In late October 1924 John G. McFee reported that his firm would be watching the mountain weather closely. Thirty more days of good weather would give the contractors a head start on their tunnel work and would enable them to continue work throughout the coming winter. Their work was no small task: well up into the mountains on the north side of the summit, they faced drilling seventeen tunnels in a stretch of sixteen miles [a distance seemingly at odds with the reported length of line called for in their contract, though perhaps the 5.3 miles constituted aggregate tunnel length]. What McFee needed was enough good weather to allow the grading crews of Kelly and Sullivan to complete *their* work so that the tunnelers could bring up their equipment and supplies. This work had proceeded somewhat more slowly than anticipated due to dry weather and fire danger: much of the brush had to be cleared by burning, and this had to be restricted to protect the timber. McFee anticipated employing nine hundred men on tunnel work and another three hundred on outside work. He very much wanted to have his crews underground before bad

weather set in, which would allow them to be far ahead of estimates by Spring 1925. The longest tunnel facing McFee's forces would be 2,400 feet long, with another at 2,100 feet, and the remainder ranging down to a few hundred feet each. Geologic conditions offered both hindrances and help: the rock to be tunneled was extremely hard, but this would also reduce the need for timbering the bores. McFee had six steam shovels at work already, and his crews had spent the summer building wagon roads and camps in preparation for the tunnel work. McFee expected to absorb 500-600 men employed by Kelly and Sullivan in clearing the right-of-way to carry out grading work.

By early December 1924 McFee's crews were experiencing severe weather in the Cascades, but were still rushing their work and expected to continue throughout the winter as McFee had said. By this time approximately 44 miles of railroad had been completed between Kirk and Oakridge, thirty-seven miles of which were from Kirk to Skookum, and the remaining seven miles from Oakridge to the end of the rail construction. Trains were operating on both sections of road as far as the rails had been laid. A sixty-five mile gap remained, though grading work was nearly completed from Skookum to the Summit helper station, a distance of 31 miles, and schedules called for track laying and ballasting to start on this stretch in early Spring 1925. At Summit the railroad grade reached an elevation of 4,842 feet. Beyond the then-present end of operated railroad south of Oakridge, the grade was ready for track laying to McCredie Hot Springs, a distance of about four miles. The most difficult part of the construction was between Oakridge and the Summit of the Cascades, on the west slope of the mountains. There the maximum grade was ninety-five feet per mile with curves as sharp as eight degrees. In this distance were to be twenty tunnels having an aggregate length of 18,720 feet, with the Summit Tunnel the longest at 3,648 feet, and the shortest tunnel having a length of 150 feet.

A workers' strike in late 1924 had not seriously hampered clearing the line. During the latter part of the summer and fall, the railroad had an average of 3,000 men employed in clearing right-of-way, grading, tunneling and track laying on the north end of the line. Because of excessive costs and difficulty of hauling, the contractors had established a number of small sawmills at convenient points in the forest adjacent to the groups of tunnels to provide construction timber for the tunnels.

Reports in mid-February 1925 indicated that, with three hundred men at work on the Summit Tunnel, the railroad contemplated its completion by Independence Day. Working from both ends, workers had already pushed in seven hundred feet from the south end and three hundred feet from the north end. A month later the railroad announced that they would soon have three thousand men at work along the project. District Freight and Passenger Agent, L.L. Graham stated that preparations were underway in anticipation of the cessation of winter. A crew of sixty Mexican workers had already resumed tracklaying, and horses shipped down to lower elevations the previous Fall for feeding were being shipped back up in anticipation of resuming grading work.

By mid-April 1925 crews were rushing tracklaying from Oakridge to McCredie Hot Springs, with a ballast train and one hundred men hard at work. The railroad anticipated that completion of the line to McCredie would add much to the speed of tracklaying farther by allowing materials to be hauled in by rail rather than by wagon on poor roads. Henry & McFee completed their work on the Summit Tunnel on schedule, holing through to complete this critical link in the Natron Cutoff.

In late 1925 the railroad announced its next intended improvement for Oregon: a new line connecting with the Natron Cutoff at Klamath Falls and driving southeast through the Tule Lake territory in Northern California to connect with the Nevada-California-Oregon Railway at Alturas, California. Southern Pacific had just purchased all the N-C-O's common stock, and was awaiting Interstate Commerce Commission approval to standard-gauge the narrow-gauge line and extend it to a meeting with the Central Pacific main line at Fernley, Nevada. This, in concert with the Natron Cutoff, would serve as a much shorter route between Ogden and Portland.

In the meantime, construction on the Natron Cutoff continued until, on June 15, 1926, the rails were joined at surveyors point G-855+50 between Cruzatte and Frazier. Quietly and without fanfare officials drove the obligatory gold spike on August 7 to officially mark completion. Fanfare, however, was to follow. In August the railroad announced a pageant to celebrate completion of the Natron Cutoff. Anticipating opening the line to local train service in September and to through train service by the end of the year, Southern Pacific planned a celebration at Eugene that would include a parade and play. To ensure promotion of the new line, the company extended invitations to chambers of commerce and other civic and industrial organizations of Oregon, Washington and California. Special delegations from Portland, San Francisco, Oakland, Sacramento and Klamath Falls attended the "Trail to Rail" fete on August 19-20, 1926, which drew nearly 50,000 celebrants.

Construction then continued on the Black Butte to Grass Lake Cutoff to eliminate that troublesome portion of the former California Northeastern. Establishing ten construction camps, Utah Construction had thrown eight hundred men and twenty-six steam shovels into the task, beginning construction on October 20, 1925. Completion of the Black Butte to Grass Lake Cutoff on April 17, 1927 and the opening of the line to through train service the same day represented the final element of the what then became known as the Cascade Line of the Shasta Division, nearly two decades after the originally-projected 1908 completion date. The new line brought San Francisco and Portland three and one-half hours closer, and running times between Los Angeles and Portland were reduced by seven hours. Final cost of the project came to $36,565,000.

Most railroads, Southern Pacific included, had not fully recovered by the time they entered the Great Depression. Still, the lessons of World War I and the lean years of the Great Depression which saw the railroads making do with less prepared them for exemplary service in World War II. While remaining in private control, the railroads became virtual arms of the military, hauling 90% of the military's freight and 97% of the troop movements. The Southern Pacific's Natron Cutoff carried materiel and troops destined for the Pacific Theater, and supplies for the shipyards of the Pacific Northwest. In contrast to the financial losses of World War I under government control, the railroads' World War II efforts garnered nearly three million dollars a day in income tax revenues for the federal government.

In 1944, *Railroads at War* told of the historic contributions of the railroads, from initially uniting the nation with construction of the transcontinental railroads to the then-present movement of freight and troops in wartime:

> America's railroads made the union of the states a physical fact, a practical reality. Today they are the great inner lifelines of that union's survival in the

> holocaust of world war: an indispensable base behind the tremendous charges under which the tyrant attackers across both oceans are now crumbling.
>
> Farseeing Americans in the early days of the republic, looking from the westward side of the Alleghenies only as far as the Mississippi, thought it might take five or ten centuries to settle those vast stretches. Railroads brought population and statehood all the way to the Pacific in a matter of decades.
>
> World War II loaded our railways with a job whose hugeness and complexity almost baffles imagination. Failure could have been fatal. They have succeeded magnificently.

Even allowing for wartime rhetoric, the railroads accomplished remarkable feats. The Southern Pacific alone eliminated 27 pre-war passenger trains and rapidly converted to handle military needs, building new bridges, lengthening passing sidings, and laying hundreds of miles of heavier rail, all to increase its capacity to serve the growing volume and weight of military traffic. With the induction of much of the younger labor force into military service, Southern Pacific soon faced a severe labor shortage as nearly 20,000 employees left for military service just as the railroad's workload burgeoned. The railroad lowered minimum and raised maximum ages for its workers, lengthened working days, canceled vacations, imported workers from Mexico, and hired women for jobs previously restricted to men, all to compensate for the shortage.

As mentioned previously the Natron Cutoff proved crucial to the railroad's war effort, and carried an enormous amount of traffic that would have astounded its original builders, and that would have simply overwhelmed the old Siskiyou line that it had replaced. The Southern Pacific found itself handling trains for the Civilian Conservation Corps and the Coast Guard, as well as hospital trains with war wounded. In addition to moving troops and war supplies, the Southern Pacific also moved 125 "alien specials," transporting trainloads of Japanese Americans to internment camps in the interior, where they were incarcerated. Nevertheless, Southern Pacific's substantial accomplishments in World War II service far overshadowed its use in this unforgettable demonstration of war hysteria and racism. At the end of the war, the railroad received commendations for what was termed its "finest hour."

The Southern Pacific's Natron Cutoff, the main line through Oregon since its completion in 1927, remained a critical element the railroad's overall system. Changes over the years have been minor, consisting largely of heavier steel rails to handle more massive rolling stock and tonnages. At any point along its length, the Natron Cutoff continues to impart a sense of time and place linked inextricably to its period of significance.

III. SOURCES

"Arguments In Central Pacific Case In St. Louis," *Southern Pacific Bulletin*, 3:23, December 15, 1915.

Asay, Jeff. *Union Pacific Northwest: The Oregon Washington Railroad & Navigation Company*. Edmonds WA: Pacific Fast Mail, 1991.

Austin, Ed and Tom Dill. *The Southern Pacific in Oregon*. Edmonds WA: Pacific Fast Mail, 1987.

Beebe, Lucius. *The Central Pacific and the Southern Pacific Railroads*. Berkeley: Howell-North, 1963.

"Blasting Near Dorris," *The Siskiyou News*, October 3, 1907.

"Bray Station, *The Siskiyou News*, December 12, 1907.

"California Northeastern to Be Extended," *The Siskiyou News*, July 8, 1909.

"Cascade Crossing," *Trains*, May 1996.

"Change In Route of Natron Extension," *Eugene Daily Guard*, October 24, 1910.

"Complete Natron Cutoff By 1913 Says Calvin," *Eugene Daily Guard*, October 25, 1911.

"Construction on Cut-Off Is Being Rushed," *Eugene Daily Guard*, December 6, 1924.

"Construction on Natron Extension," *Eugene Weekly Guard*, March 16, 1906.

"Contract Let For Depots Along Natron Line," *Eugene Daily Guard*, October 21, 1911.

"Contractor Arrested," *The Siskiyou News*, December 31, 1908.

"Contracts on Natron-Klamath Extension," *Eugene Weekly Guard*, May 11, 1906.

"Court News," *Railway Age Gazette*, 55:2, July 11, 1913; 59:26, December 24, 1915.

"Delay on the C.N. Ry.," *The Siskiyou News*, March 7, 1907.

"Dorris, *The Siskiyou News*, February 27, 1908.

"Dorris Doings," *The Siskiyou News*, September 19, 1907.

"Dorris Items," *The Siskiyou News*, November 12, 1907.

"Dorris Tunnel Wrecked," *The Siskiyou News*, April 22, 1909.

"Dorris Votes to Incorporate," *The Siskiyou News*, December 24, 1908.

Dunscomb, Guy L. *A Century of Southern Pacific Steam Locomotives.* Modesto: Guy L. Dunscomb, 1963.

"Engineer Hoey Goes To Look After Work At Klamath End," *Eugene Daily Guard,* January 15, 1912.

"Eugene-Klamath Road Will Be Main Route Of Southern Pacific," *Eugene Weekly Guard,* August 30, 1906.

"Faster Trains Will Run on New Cascade Line Beginning April 17," *Southern Pacific Bulletin,* 15:4, April 1927.

Fickewirth, Alvin A. *California Railroads: An Encyclopedia of Cable Car, Common Carrier, Horsecar, Industrial, Interurban, Logging, Monorail, Motor Road, Short Lines, Streetcar, Switching and Terminal Railroads in California (185101992).* San Marino: Golden West Books, 1992.

Fitzgerald, J.D. "Shasta Division--Gateway to the North," *Southern Pacific Bulletin,* 9:7, July 1920.

"From 'Oregon Trail' to Portland Division," *Southern Pacific Bulletin,* 10:5, May 1921.

"General News Section," *Railway Age Gazette,* 50:26, June 30, 1911.

"Government Assumes Direction of American Railroads," *Southern Pacific Bulletin,* 6:1, January 1, 1918.

"Government Loses Central Pacific Suit," *Railway Age Gazette,* 62:12, March 23, 1917.

"H.P. Hoey, Prominent Construction Engineer Dies at Oakridge," *Southern Pacific Bulletin,* 13:10, October 1924.

"Heavy Work On Natron Extension," *Eugene Daily Guard,* January 5, 1911.

Hofsommer, Don L. *The Southern Pacific, 1901-1985.* College Station TX: Texas A & M University Press, 1986.

"Huge Rock Falls And Crushes Steam Shovel," *Eugene Daily Guard,* June 2, 1910.

"Important Appointments Made By United States Railroad Administration," *Southern Pacific Bulletin,* 6:14, July 15, 1918.

"J. Kruttschnitt Makes Short Eugene Visit," *Eugene Daily Guard,* December 12, 1910.

"Klamath Falls Will Celebrate State of Construction for New Line," *Southern Pacific Bulletin,* 12:10, October 1923.

"Last Rails Laid on New Lines of Company in Arizona and Oregon," *Southern Pacific Bulletin,* 14:7, July 1926.

"Laying Of Track On Cut-Off Is Being Hurried," *Eugene Daily Guard*, April 13, 1925.

"Macdoel," *The Siskiyou News*, October 31, 1907; February 27, 1908; May 5, 1910.

"May Construct Railroad From Natron First," *Eugene Weekly Guard*, July 26, 1906.

"May Have Thrown Up Railroad Contract," *Eugene Daily Guard*, November 19, 1910.

"Mount Hebron," *The Siskiyou News*, July 16, 1908.

"Natron Cut-off Had 43 Miles in Operation on November 11," *Southern Pacific Bulletin*, 13:12, December 1924.

"Natron Extension Announced," *Eugene Weekly Guard*, December 15, 1905.

"Natron Extension Soon," *Eugene Weekly Guard*, January 12, 1906.

"Natron New Lively Railroad Camp," *Eugene Daily Guard*, October 7, 1909.

"Natron-Ontario Line Will Be Built Soon," *Eugene Weekly Guard*, August 23, 1906.

"New Cascades Line is Celebrated at Eugene," *Southern Pacific Bulletin*, 14:9, September 1926.

"New Line Being Built Around Shasta's Base," *Southern Pacific Bulletin*, 17:3, March 1926.

"New Line to California," *Eugene Weekly Guard*, October 27, 1905.

"New Oregon Line Taps Big, Rich Territory," *Southern Pacific Bulletin*, 12:10, October 1923.

"New Train Service From Eugene To Oakridge," *Eugene Daily Guard*, April 29, 1912.

"News From Mead Office of S.P. As To Letting of Contract," *Eugene Daily Guard*, Special Edition, November 1, 1911.

"No Slowing Down!," *Southern Pacific Bulletin*, 9:21, February 1920.

"Pageant To Celebrate New Cascade Line Construction," *Southern Pacific Bulletin*, 14:8, August 1926.

"Picard," *The Siskiyou News*, September 26, 1907.

"Progress on the California Northeastern," *The Siskiyou News*, March 28, 1907.

"Railroad Construction," *Railroad Age Gazette*, 46:12, March 19, 1909.

"Railroad Construction," *The Railroad Gazette*, 41:9, August 27, 1906.

"Railroad Construction Company Moving, *Eugene Daily Guard*, September 9, 1910.

"Railroad Work at Klamath Falls," *Eugene Weekly Guard*, August 23, 1906.

"Railway Construction," *Railway Age Gazette*, 51:3, July 21, 1911; 51:7, August 18, 1911; 51:16, October 20, 1911; 51:22, December 1, 1911; 51:25, December 22, 1911; 52:1, January 5, 1912; 52:4, January 26, 1912; 52:25, June 21, 1912; 54:13, March 28, 1913; 59:1, July 2, 1915; 61:13, September 29, 1916.

"Railway Financial News," *Railway Age Gazette*, 59:1, July 2, 1915.

"Rapid Progress Made on New Line in Oregon," *Southern Pacific Bulletin*, 13:2, February 1924.

"S.P. Co. Bust At Oakridge," *Eugene Daily Guard*, December 27, 1911.

"S.P. Officials To Accept Natron Extension," *Eugene Daily Guard*, April 10, 1912.

"S.P. Plans Road To California," *Eugene Daily Guard*, September 22, 1910.

"S.P. Spending Millions to Improve Lines," *Southern Pacific Bulletin*, 12:9, September 1923.

"S.P. Surveyors at Jasper," *Eugene Weekly Guard*, January 26, 1906.

Signor, John R. *Rails in the Shadow of Mt. Shasta: 100 Years of Railroading Along Southern Pacific's Shasta Division.* San Diego: Howell North Books, 1982.

"Shipping Railroad Supplies From Goshen," *Eugene Daily Guard*, October 2, 1909.

"Slide Partially Covers Train," *Eugene Daily Guard*, February 27, 1912.

"Southern Pacific Builds Important Line in Oregon," *Railway Age*, 79:20, November 14, 1925.

"Southern Pacific Retains Central Pacific," *Railway Age Gazette*, 62:13, March 30, 1917.

Sproule, William. "Threatened Disruption of Our Lines," *Southern Pacific Bulletin*, 11:7, July 1922.

"Start on New Line Celebrated," *Southern Pacific Bulletin*, 12:11, November 1923.

Steam Shovels At Work On New Road," *Eugene Daily Guard*, October 4, 1909.

"The New Town of Dorris," *The Siskiyou News*, September 5, 1907.

"The Proposed Klamath Falls Line of the Southern Pacific," *The Railroad Gazette*, 42:23, June 7, 1907.

"The Union Pacific-Southern Pacific Dissolution," *Railway Age Gazette*, 54:7, February 14, 1913.

"Train Service Natron Line Next Year," *Eugene Daily Guard*, December 13, 1910.

"Train Service On Natron Line," *Eugene Daily Guard*, October 27, 1911.

"Transportation from Mt. Hebron to Klamath Falls," *The Siskiyou News*, September 5, 1907.

"Union Pacific-Southern Pacific Merger Upheld," *Railway Age Gazette*, 50:26, June 30, 1911.

"United States District Court In Unmerger Decision Upholds Integrity of Southern Pacific-Central Pacific System," *Southern Pacific Bulletin*, 5:6, March 15, 1917.

United States Geological Survey. Topographic map. Bray, Calif. quadrangle, 7.5' series, Provisional Edition 1988.

United States Geological Survey. Topographic map. Dorris, Calif. quadrangle, 7.5' series, Provisional Edition 1985.

United States Geological Survey. Topographic map. Grass Lake, Calif. quadrangle, 7.5' series, Provisional Edition 1986.

United States Geological Survey. Topographic map. Hotlum, Calif. quadrangle, 7.5' series, Provisional Edition 1986.

United States Geological Survey. Topographic map. Juniper Flat, Calif. quadrangle, 7.5' series, Provisional Edition 1984.

United States Geological Survey. Topographic map. Macdoel, Calif. quadrangle, 7.5' series, Provisional Edition 1985.

United States Geological Survey. Topographic map. Penoyar, Calif. quadrangle, 7.5' series, Provisional Edition 1986.

United States Geological Survey. Topographic map. Sheep Mountain, Calif. quadrangle, 7.5' series, Provisional Edition 1985.

United States Geological Survey. Topographic map. The Whaleback, Calif. quadrangle, 7.5' series, Provisional Edition 1986.

United States Geological Survey. Topographic map. Agency Lake, Oreg. quadrangle, 7.5' series, Provisional Edition 1985.

United States Geological Survey. Topographic map. Chemult, Oreg. quadrangle, 7.5' series, 1967.

United States Geological Survey. Topographic map. Chiloquin, Oreg. quadrangle, 7.5' series, Provisional Edition 1988.

United States Geological Survey. Topographic map. Crescent Lake, Oreg. quadrangle, 7.5' series, 1967 (photorevised 1981).

United States Geological Survey. Topographic map. Diamond Peak, Oreg. quadrangle, 7.5' series, Provisional Edition 1986.

United States Geological Survey. Topographic map. Fall Creek Lake, Oreg. quadrangle, 7.5' series, Provisional Edition 1986.

United States Geological Survey. Topographic map. Fuego, Oreg. quadrangle, 7.5' series, Provisional Edition 1988.

United States Geological Survey. Topographic map. Hamaker Mtn., Oreg.-Calif.quadrangle, 7.5' series, Provisional Edition 1986.

United States Geological Survey. Topographic map. Jasper, Oreg. quadrangle, 7.5' series, Provisional Edition 1986.

United States Geological Survey. Topographic map. Klamath Falls, Oreg. quadrangle, 7.5' series, Provisional Edition 1985.

United States Geological Survey. Topographic map. Lenz, Oreg. quadrangle, 7.5' series, Provisional Edition 1988.

United States Geological Survey. Topographic map. Lowell, Oreg. quadrangle, 7.5' series, Provisional Edition 1986.

United States Geological Survey. Topographic map. Mazama, Oreg. quadrangle, 7.5' series, 1967.

United States Geological Survey. Topographic map. McCredie Springs, Oreg. quadrangle, 7.5' series, Provisional Edition 1986.

United States Geological Survey. Topographic map. Modoc Point, Oreg. quadrangle, 7.5' series, Provisional Edition 1985.

United States Geological Survey. Topographic map. Mount June, Oreg. quadrangle, 7.5' series, Provisional Edition 1986.

United States Geological Survey. Topographic map. Mt. David Douglas, Oreg. quadrangle, 7.5' series, Provisional Edition 1986.

United States Geological Survey. Topographic map. Muttonchop Butte, Oreg. quadrangle, 7.5' series, 1967.

United States Geological Survey. Topographic map. Oakridge, Oreg. quadrangle, 7.5' series, Provisional Edition 1986.

United States Geological Survey. Topographic map. Odell Butte, Oreg. quadrangle, 7.5' series, 1967 (photorevised 1981).

United States Geological Survey. Topographic map. Odell Lake, Oreg. quadrangle, 7.5' series, 1963 (photorevised 1981).

United States Geological Survey. Topographic map. Shoalwater Bay, Oreg. quadrangle, 7.5' series, Provisional Edition 1985.

United States Geological Survey. Topographic map. Soloman Butte, Oreg. quadrangle, 7.5' series, Provisional Edition 1988.

United States Geological Survey. Topographic map. Springfield, Oreg. quadrangle, 7.5' series, 1967 (photorevised 1986).

United States Geological Survey. Topographic map Westfir East, Oreg. quadrangle, 7.5' series, Provisional Edition 1986.

United States Geological Survey. Topographic map. Westfir West, Oreg. quadrangle, 7.5' series, Provisional Edition 1986.

United States Geological Survey. Topographic map. Willamette Pass, Oreg. quadrangle, 7.5' series, Provisional Edition 1986.

United States Geological Survey. Topographic map. Wocus, Oreg. quadrangle, 7.5' series, Provisional Edition 1985.

United States Geological Survey. Topographic map. Worden, Oreg.-Calif. quadrangle, 7.5' series, Provisional Edition 1986.

"Utah Construction Company Is Shipping Away Its Outfit," *Eugene Daily Guard*, November 11, 1910.

"Work Is Resumed On S.P. Natron Extension," *Eugene Daily Guard*, January 1, 1912.

"Work Soon To Be Underway On 17 Tunnels," *Eugene Daily Guard*, October 27, 1924.

"Working On North Fork Railroad Bridge," *Eugene Daily Guard*, October 9, 1911.

Yenne, Bill. *The History of the Southern Pacific*. New York: Bonanza, 1985.

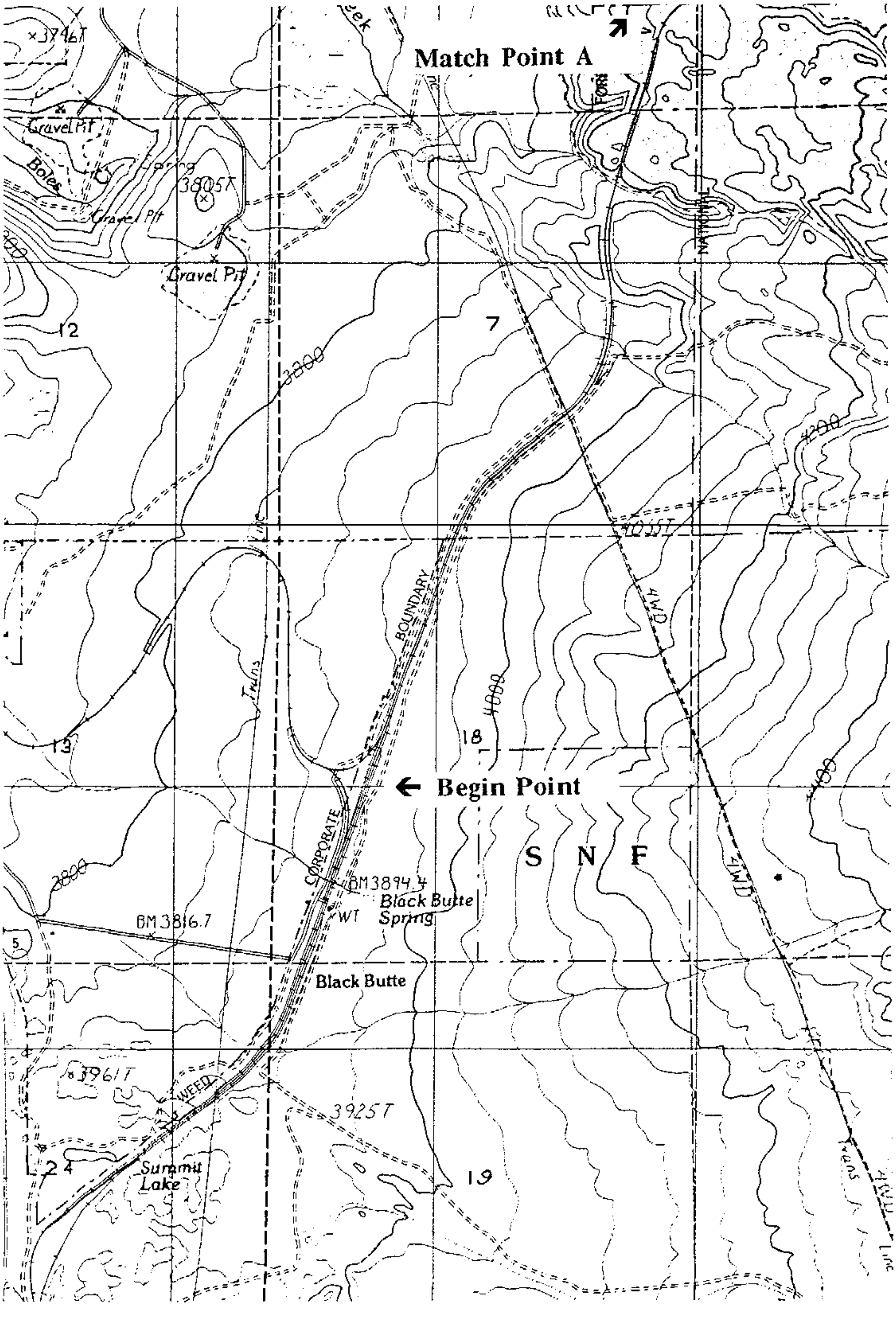
"200 Men At Work On Extension Above Natron," *Eugene Daily Guard*, February 20, 1912.

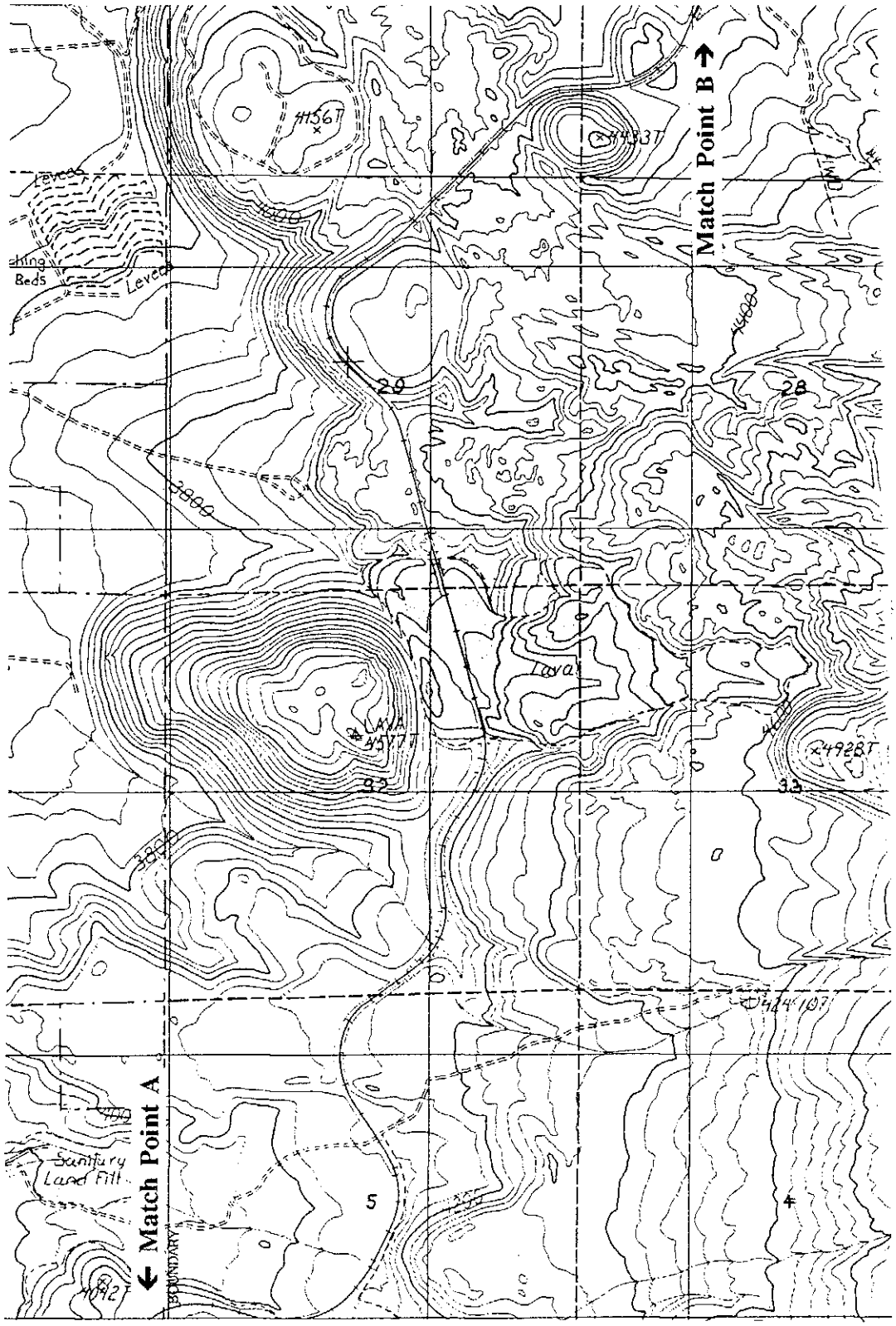
"300 Men Busy On Big S.P. Tunnel," *Eugene Daily Guard*, February 11, 1925.

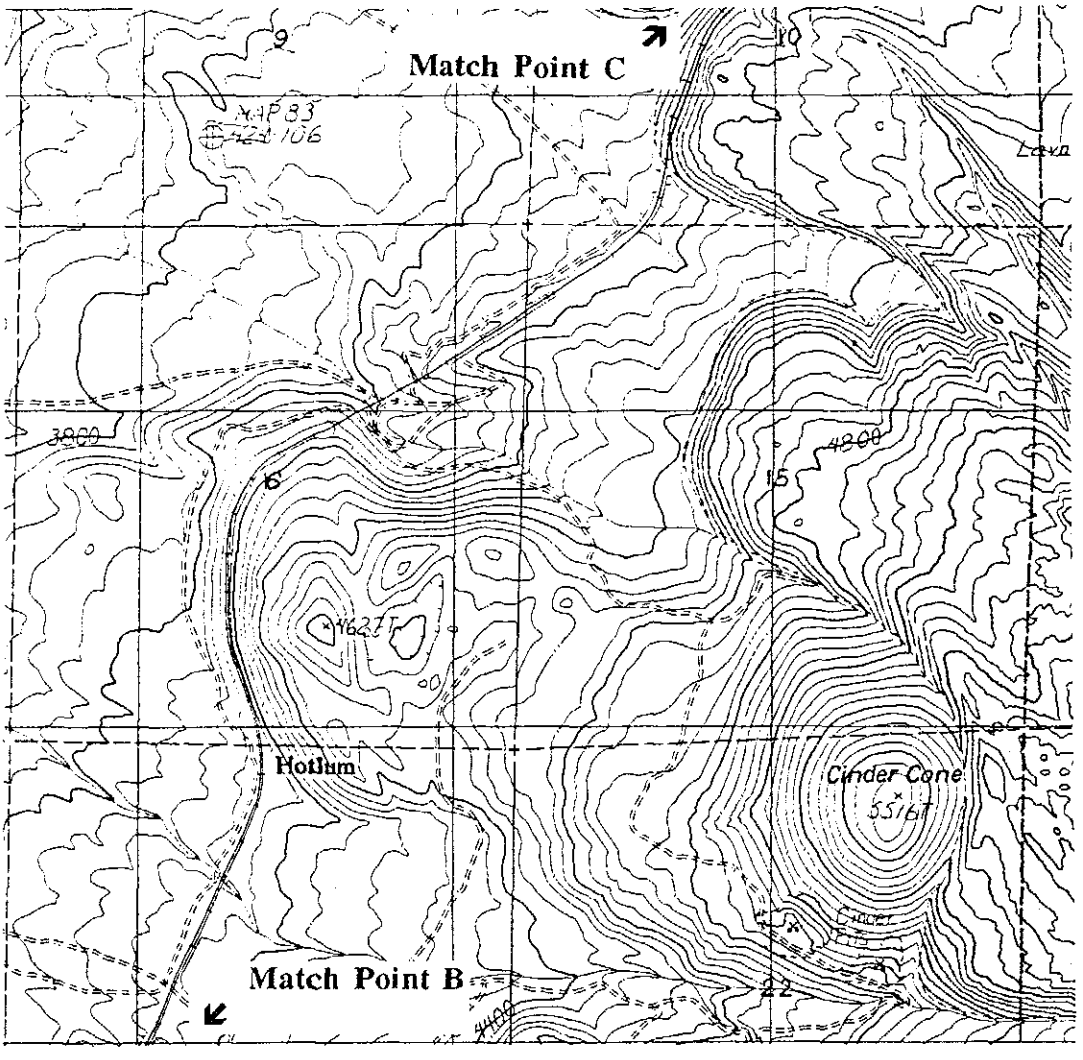
"3,000 Men To Take Up Work Along Cut-Off," *Eugene Daily Guard*, March 20, 1925.

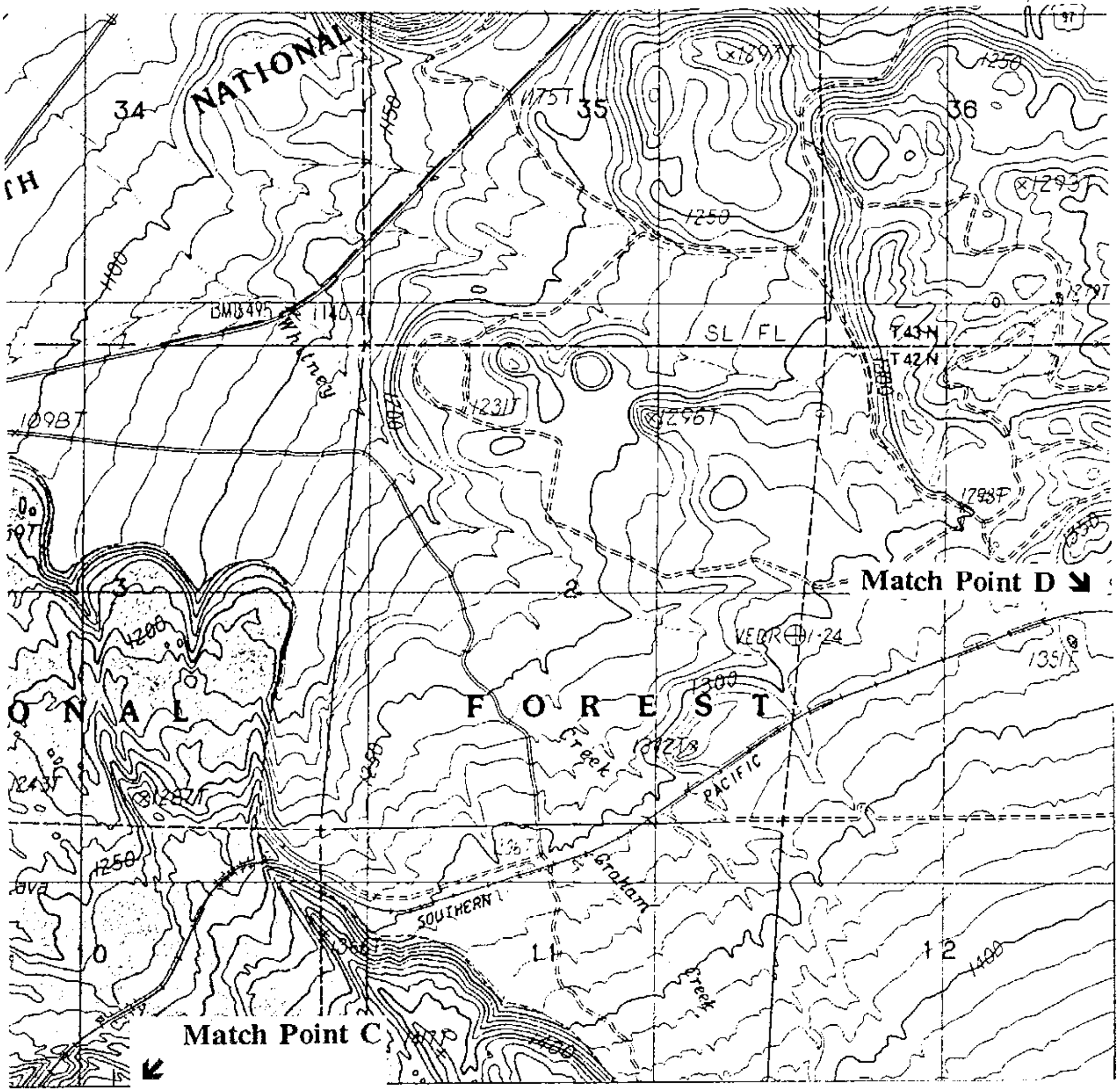
IV. PROJECT INFORMATION

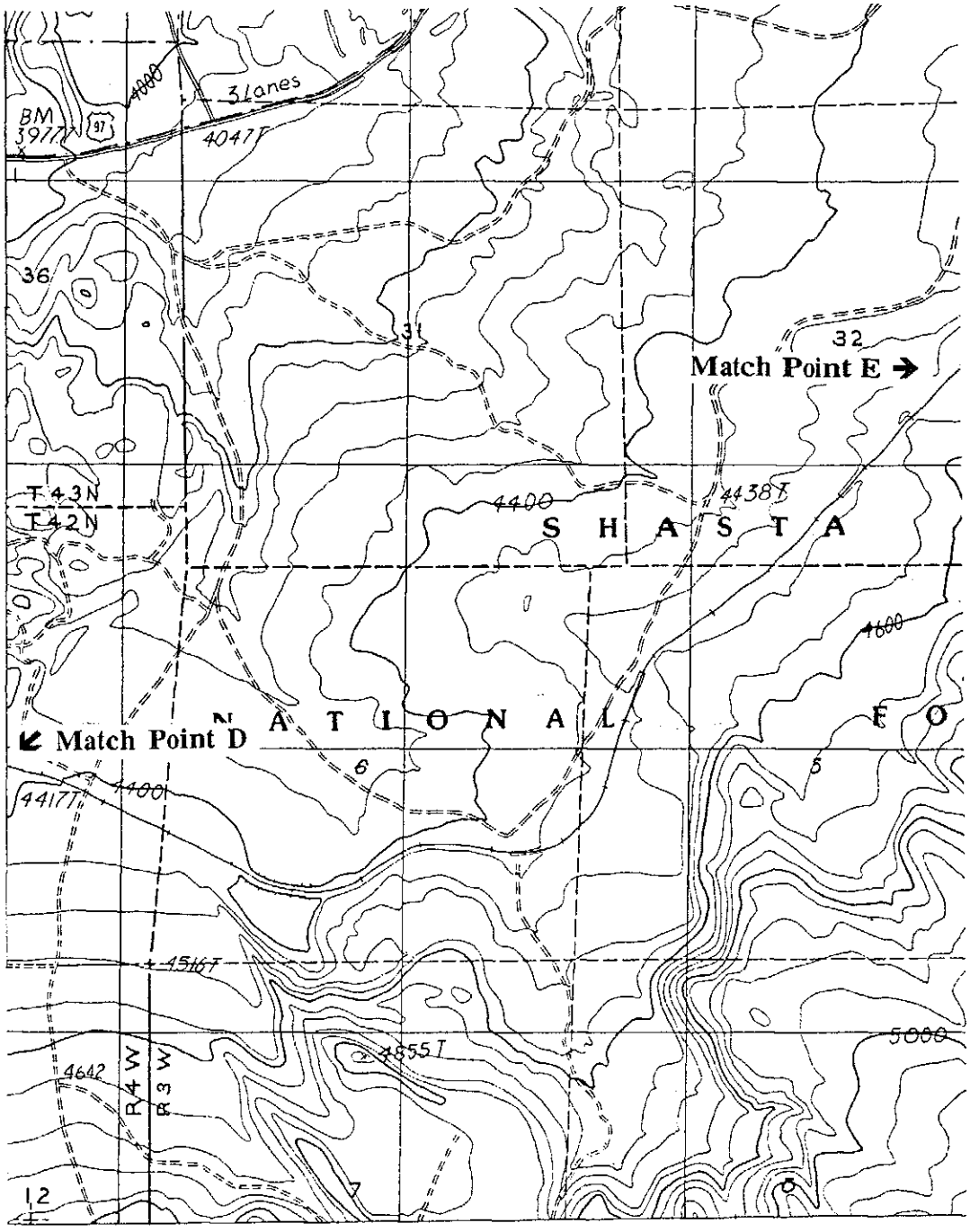
As a result of the 1996 merger of the Union Pacific and Southern Pacific Railroads, a federal undertaking under the jurisdiction of the Surface Transportation Board of the U.S. Department of Transportation, and in order to accommodate freight trains utilizing longer and taller cars and loads--tri-level auto rack cars and cars carrying double-stacked containers--the Union Pacific will need to increase tunnel clearances on the former Southern Pacific Natron Cutoff. The tunnels, built between 1905 and 1927, are contributing elements of the National Register-eligible Southern Pacific Cascade Route Tunnels Historic District. The railroad has laser-measured all tunnels and will determine clearance needs on a tunnel-by-tunnel basis. Some, because of curved alignment, will require interior work to allow for longer cars such as tri-level auto rack cars; others will require both interior and portal work to provide sufficient vertical clearance for "double-stack" container cars. The latter work may impact the character-defining tunnel portals if crown mining of the tunnels (as opposed to lowering the tunnel floors) is selected. Inasmuch as this would cause an adverse effect to the tunnels, Union Pacific, in consultation with the California and Oregon SHPOs, has elected to record the tunnels for the Historic American Engineering Record. A field review with Oregon SHPO staff resulted in the guidance to document representative examples of tunnels from the early and late periods of construction in that state; documentation of both tunnels to be modified in California is consistent with documentation previously carried out on the Southern Pacific Donner Pass Route Tunnels Historic District (HAER CA-196). Documentation was carried out by P.S. Preservation Services, John Snyder Field Director and Historian, and Ed Andersen, Photographer. Photos were made in November 1997, and research was carried in June 1997, and from November 1997 through April 1998.

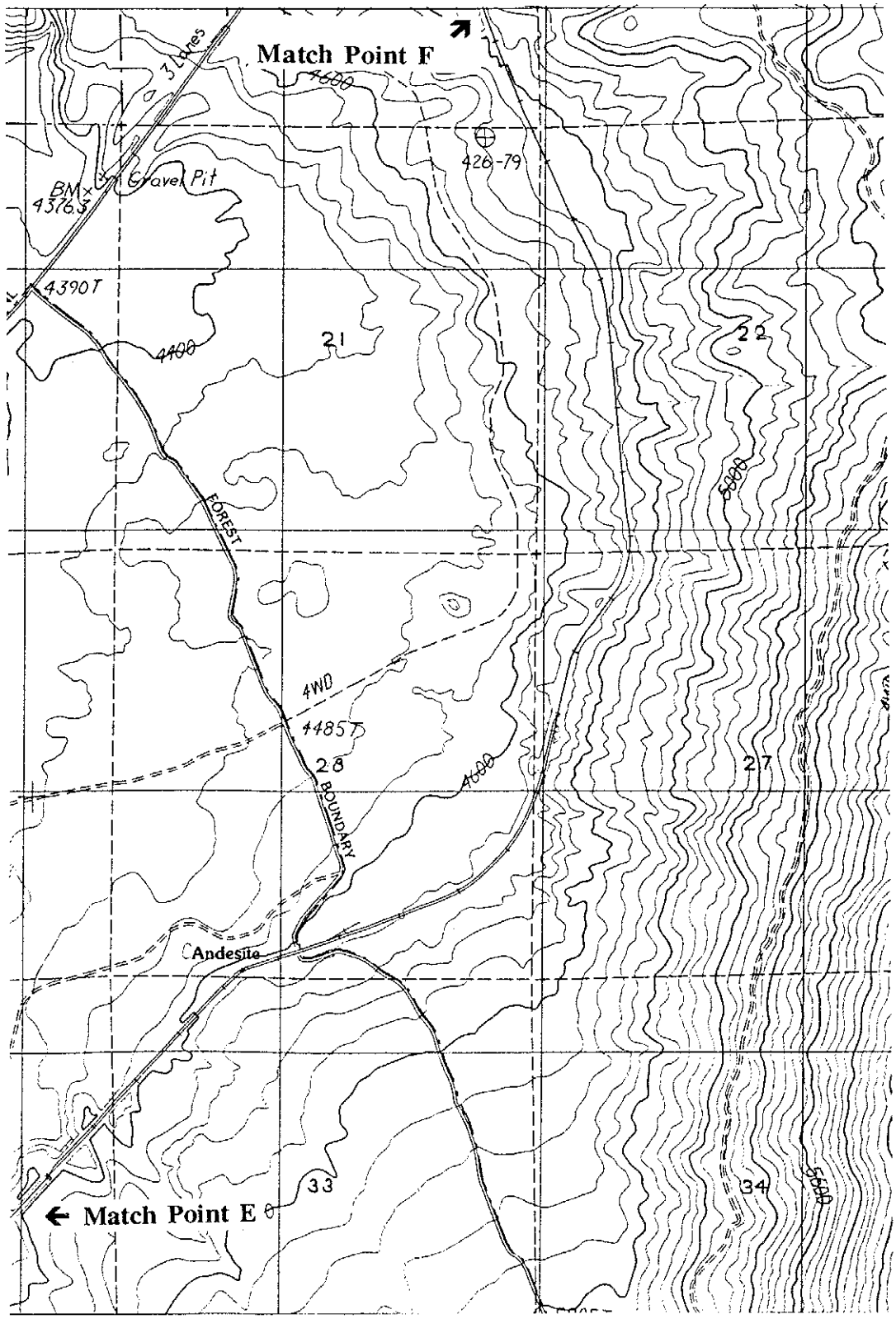

Match Point A
Begin Point
Black Butte
S N F
Gravel Pit
Boles
3805T
12
7
13
18
19
24
3800
4000
4035T
4WD
BOUNDARY
CORPORATE
BM3894.4
Black Butte Spring
WT
BM 3816.7
3961T
3925T
WEED
Summit Lake
NATIONAL
4200

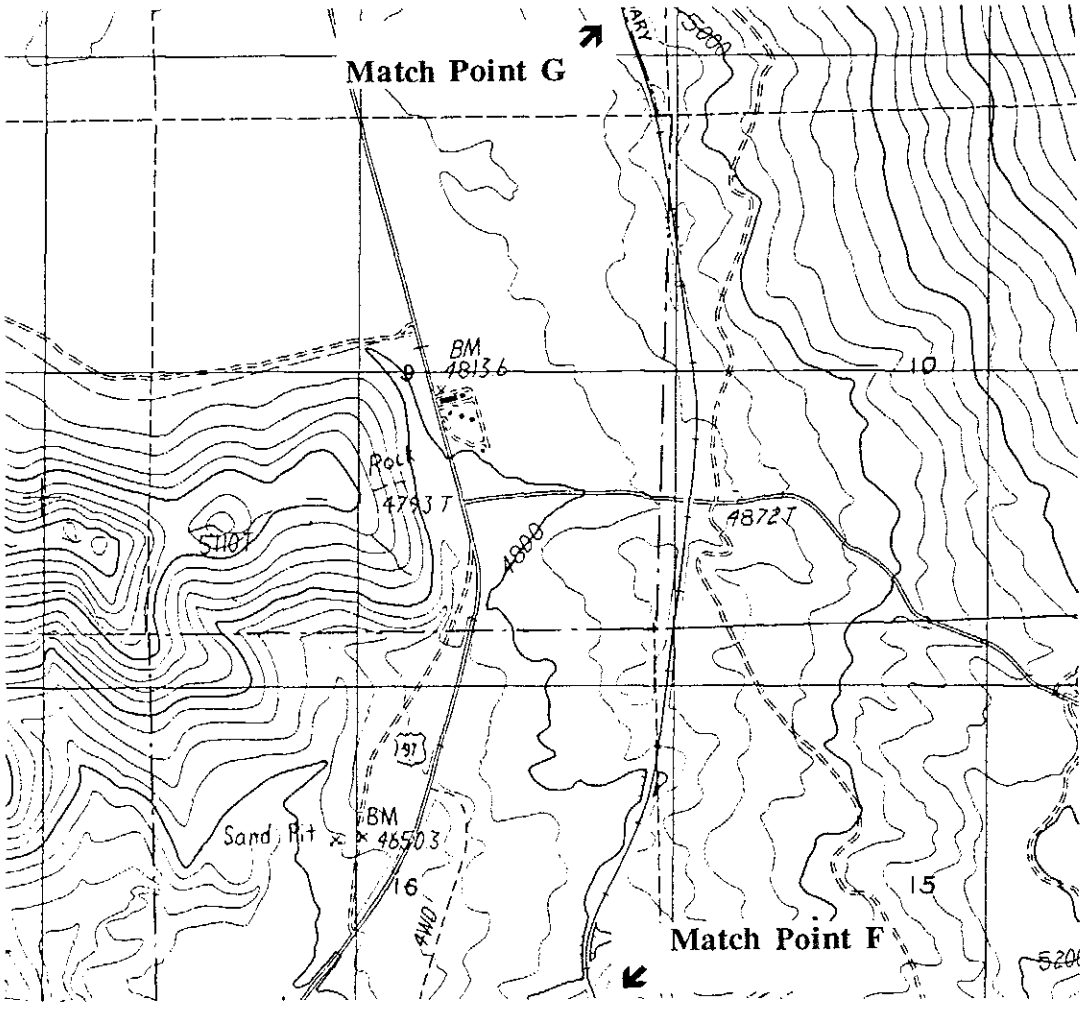

Match Point B
Match Point A
Levees
Settling Beds
Levees
Lava
Sanitary Land Fill
BOUNDARY
29
28
32
33
5
4

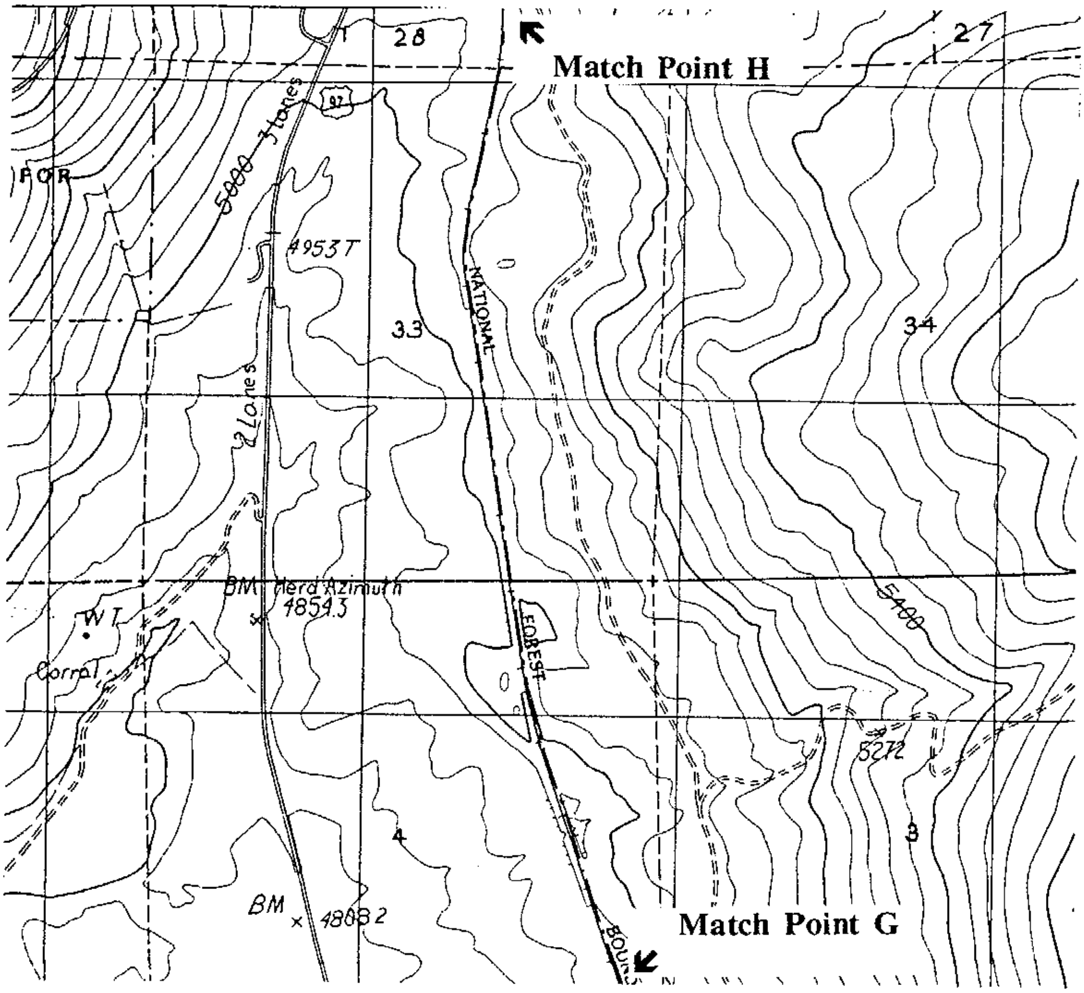

Match Point C
Match Point B
Hotlum
Cinder Cone
9
10
15
16
22
3800
4800
4400

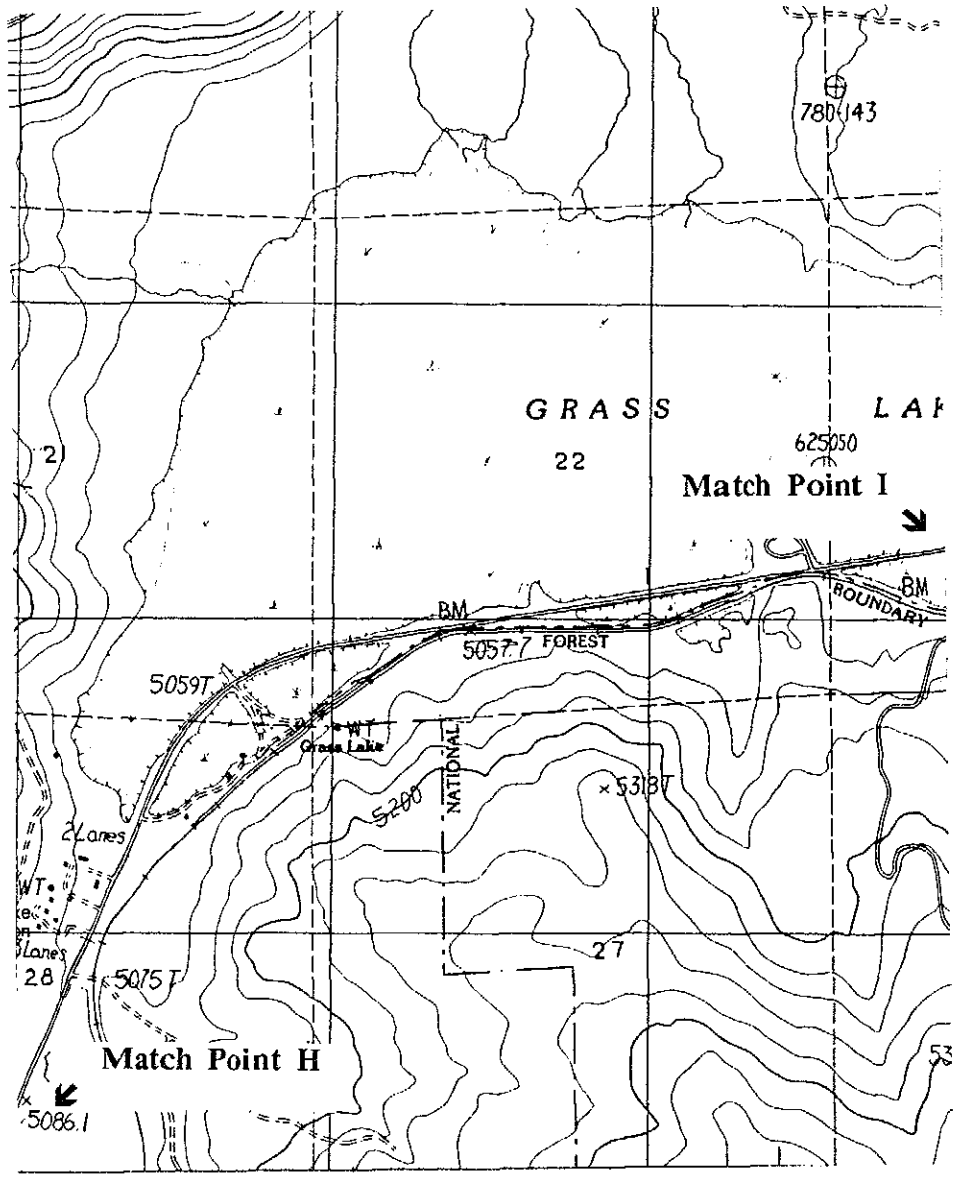

NATIONAL
FOREST
34
35
36
2
3
12
SL / FL
T 43 N
T 42 N
Whitney
Graham Creek
SOUTHERN
PACIFIC
Match Point D
Match Point C

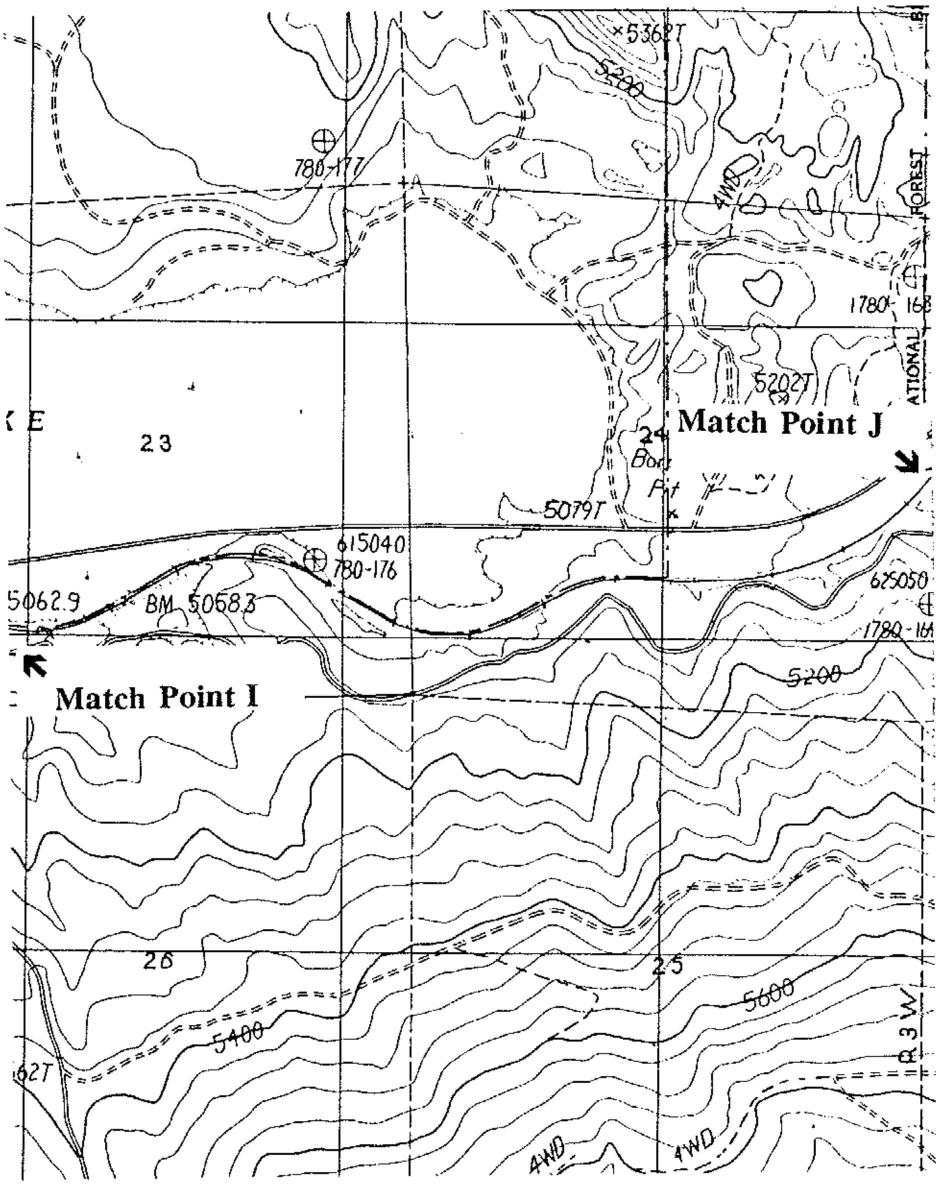

BM 3977
97
4000
3 lanes
4041T
36
31
32
Match Point E
T 43 N
T 42 N
4400
4438T
S H A S T A
4600
N A T I O N A L F O
Match Point D
6
5
4417T
4400
4516T
4655T
5000
4642
R 4 W
R 3 W
12

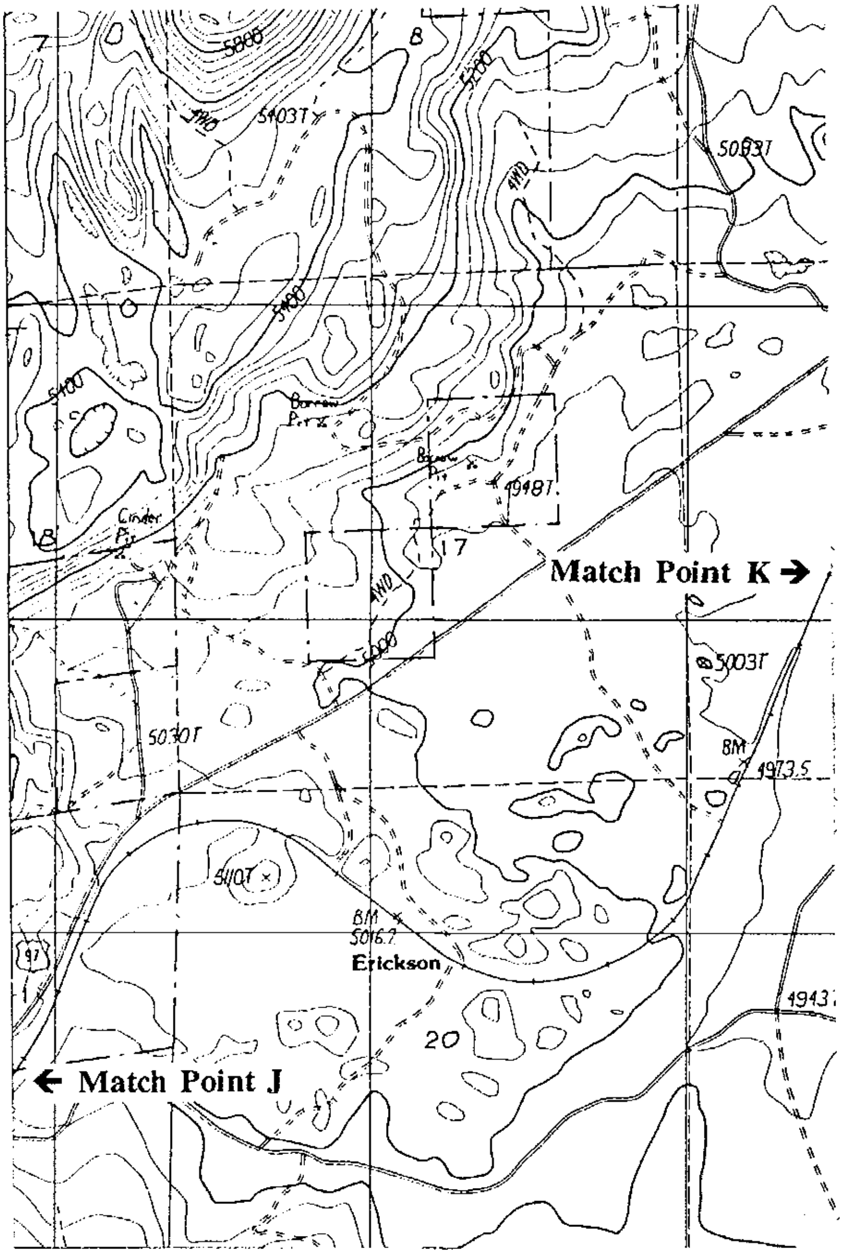

Match Point F
3 Lakes
4600
426-79
BM x 4376
Gravel Pit
4390T
4400
21
22
5000
FOREST
4WD
4485T
28
27
4000
BOUNDARY
Andesite
33
34
5600
Match Point E

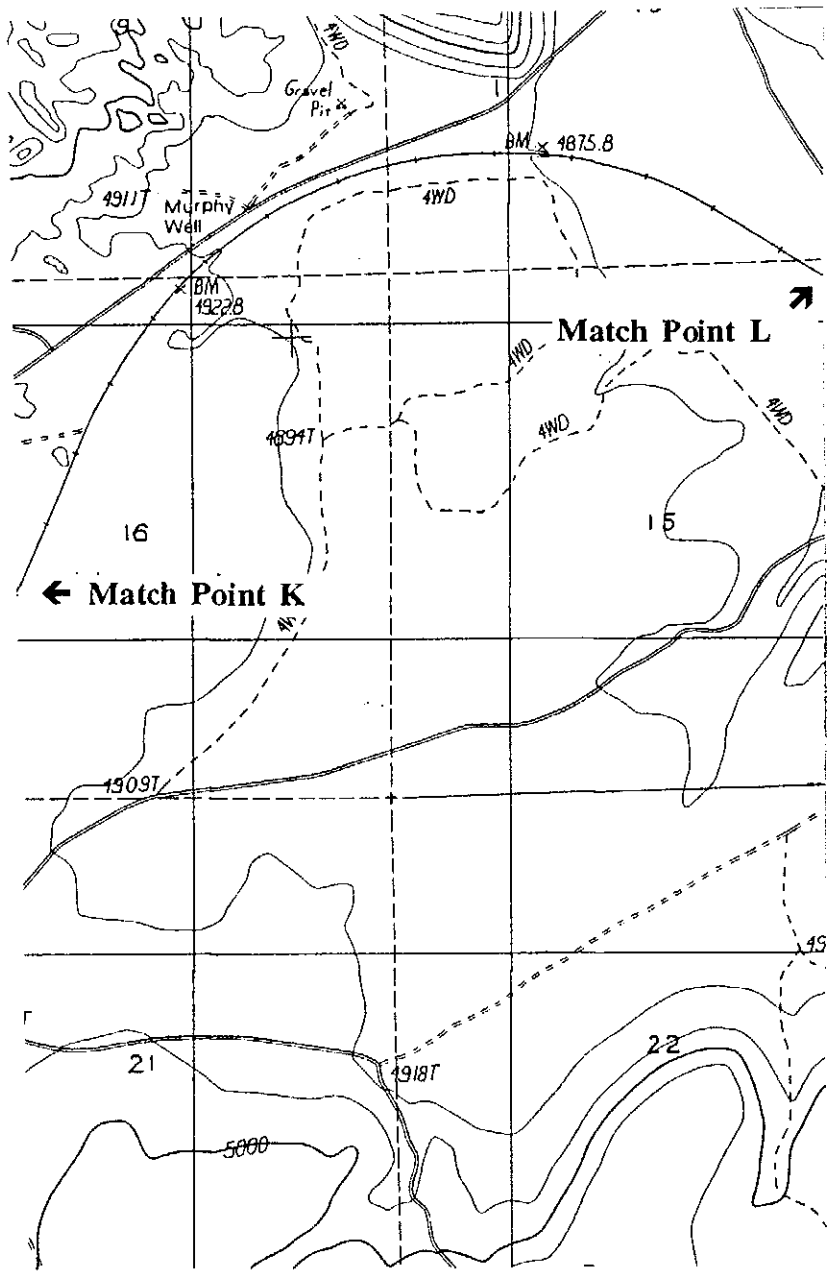

Match Point G
ARY
5000
BM
4813.6
10
Rock
4793 T
4872 T
5110 T
4800
91
BM
4650.3
Sand Pit
16
15
4WD
Match Point F
5200

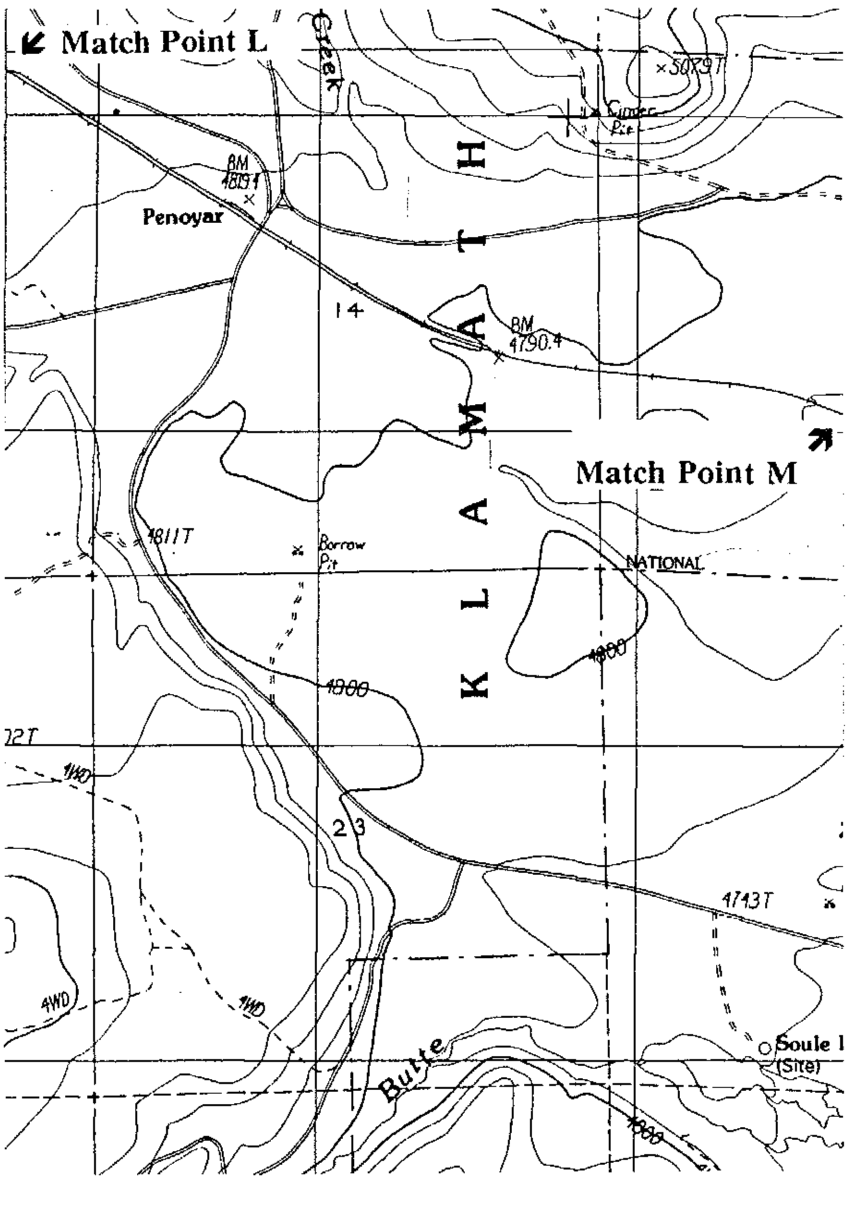

28
27
Match Point H
97
FOR
5000
3 Lanes
4953T
NATIONAL
33
34
2 Lanes
BM Herd Azimuth
4854.3
W.T.
Corral
FOREST
5400
5272
4
3
BM
4888.2
BOUN
Match Point G

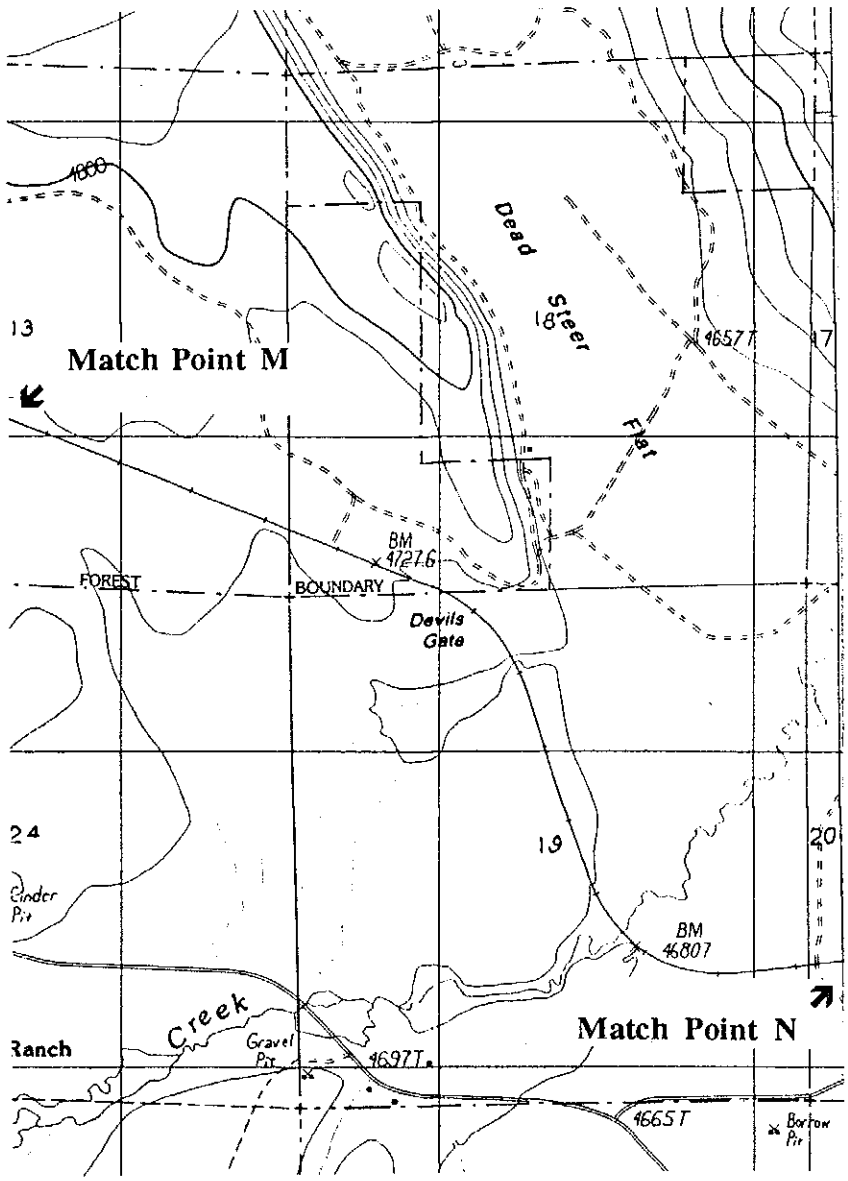

780 143
GRASS
LAK
22
625050
Match Point I
BM
BOUNDARY
BM
5057.7 FOREST
5059T
WT
Grass Lake
NATIONAL
5200
5318T
2 Lanes
WT
Lanes
28
5075T
27
Match Point H
5086.1

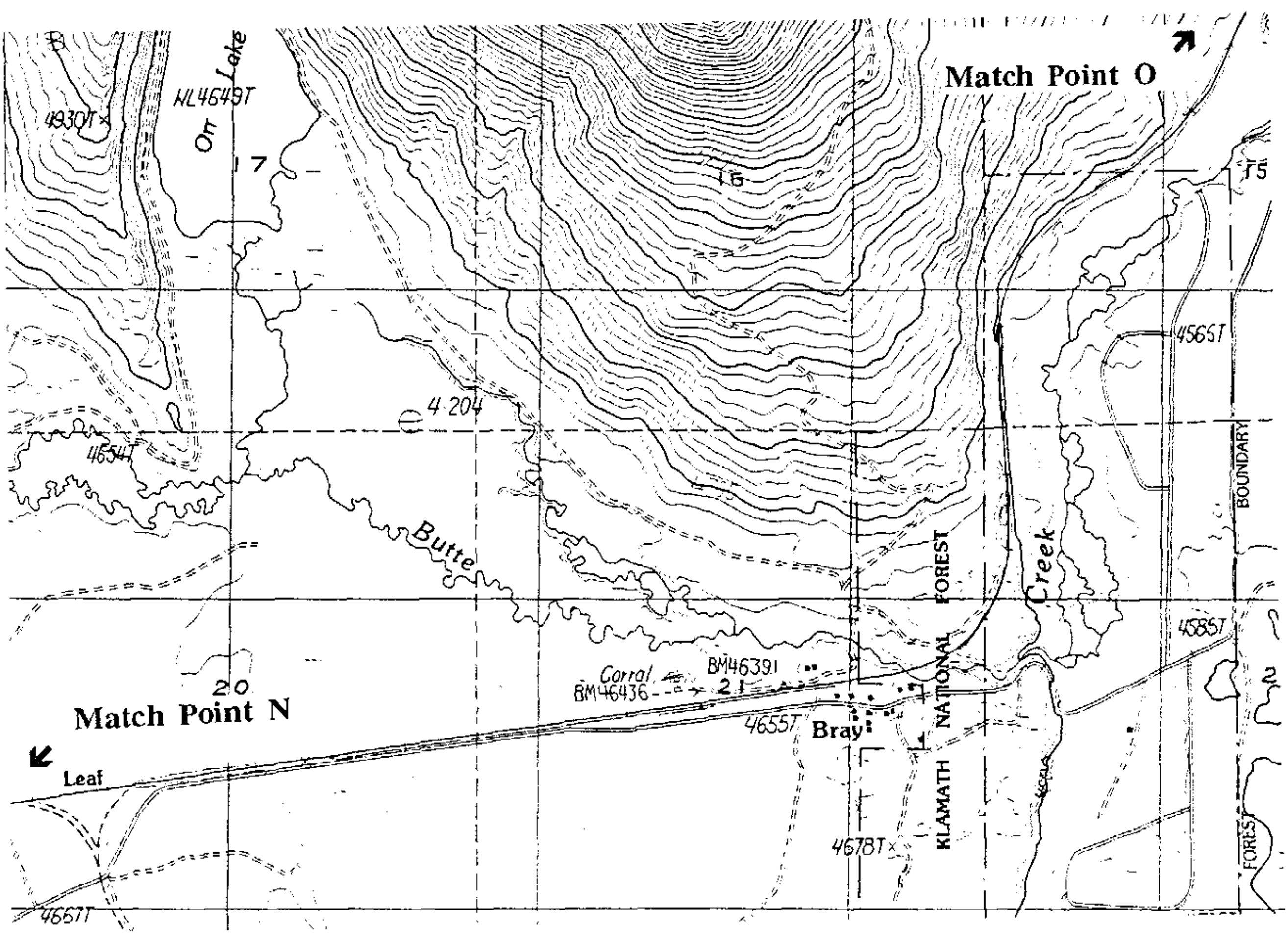

Match Point J
Match Point I
5200
5400
5600
780-177
780-176
615040
625050
BM 5058.3
5062.9
5079T
5202T
23
24
25
26
4WD
FOREST
R 3 W

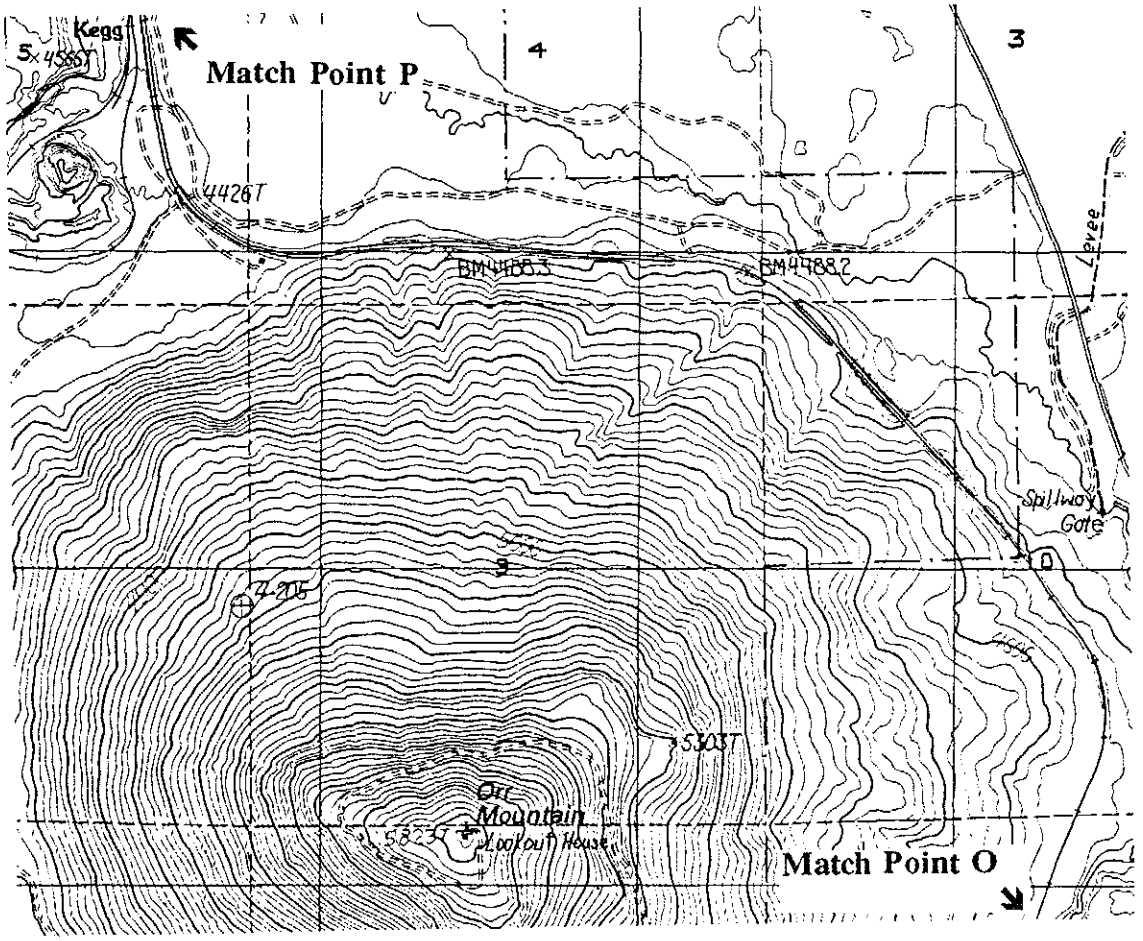

5800
5403T
4WD
5200
5083T
5400
5100
Borrow Pit
Borrow Pit
4948T
Cinder Pit
17
Match Point K →
4WD
5000
5003T
5030T
BM 4973.5
5110T
BM 5016.7
Erickson
97
4943T
20
← Match Point J

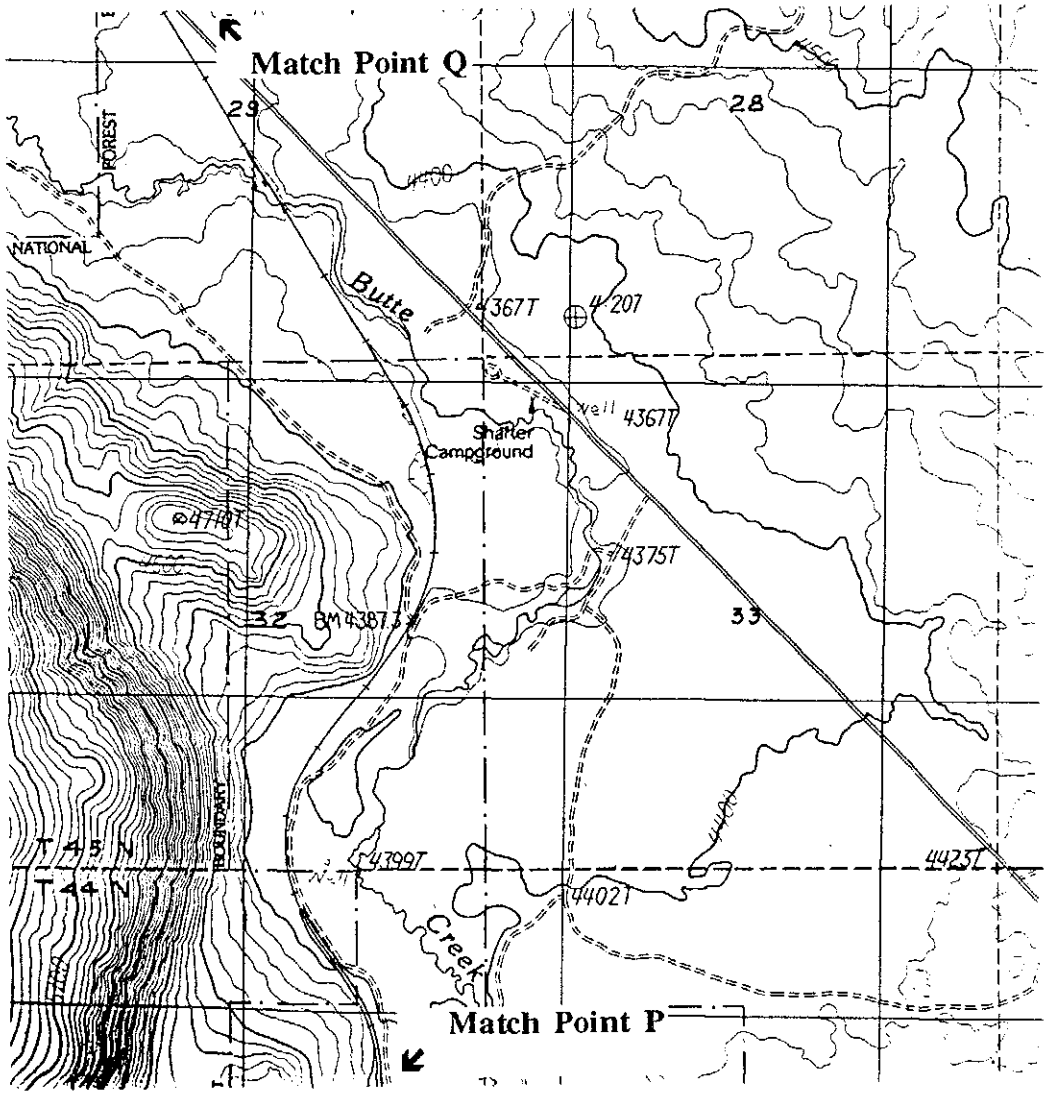

4WD
Gravel Pit
BM 4875.8
4911T
Murphy Well
4WD
BM 19228
Match Point L
4WD
4WD
4WD
4894T
16
15
Match Point K
1909T
21
4918T
22
5000

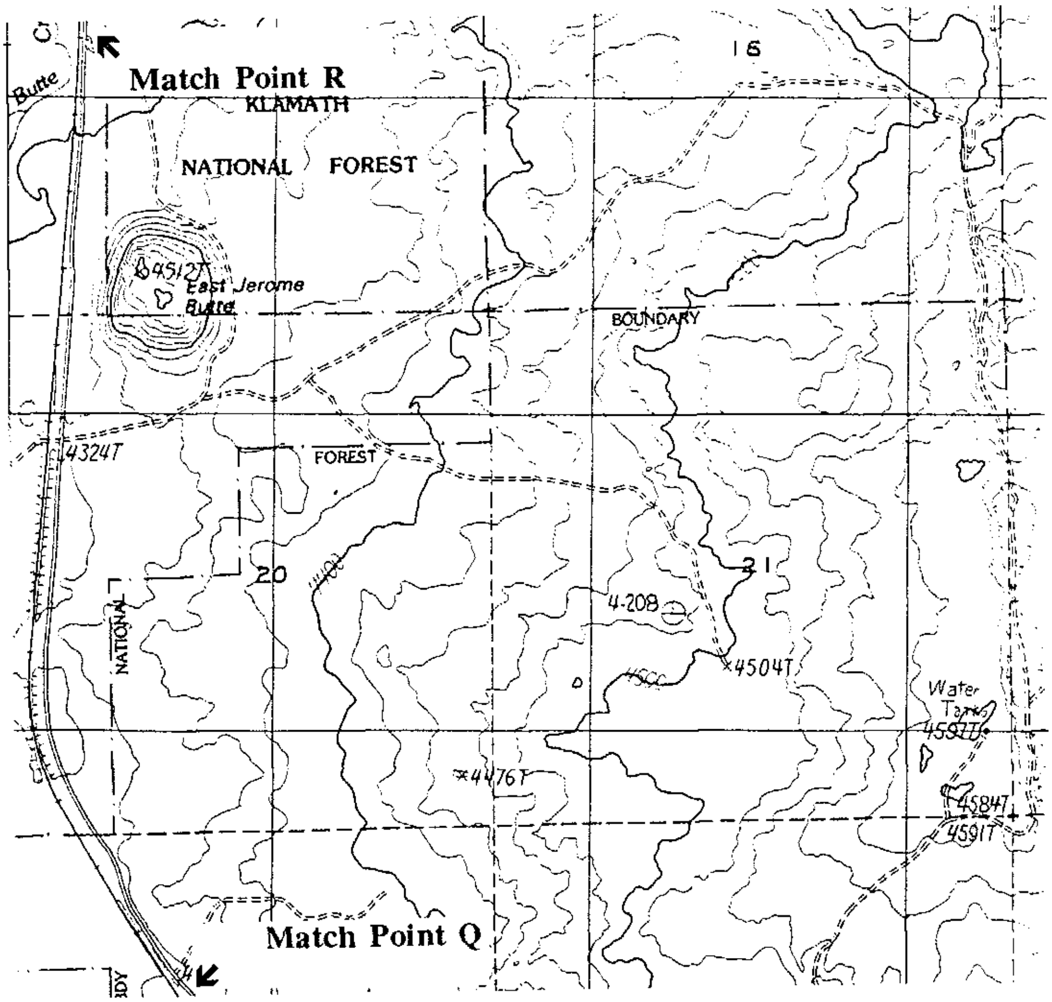

Match Point L
Match Point M
Penoyar
Creek
BM 4819.1
BM 4790.4
14
23
Cinder Pit
Borrow Pit
4811T
4800
4743T
4WD
NATIONAL
K L A M A T H
Butte
Soule
(Site)

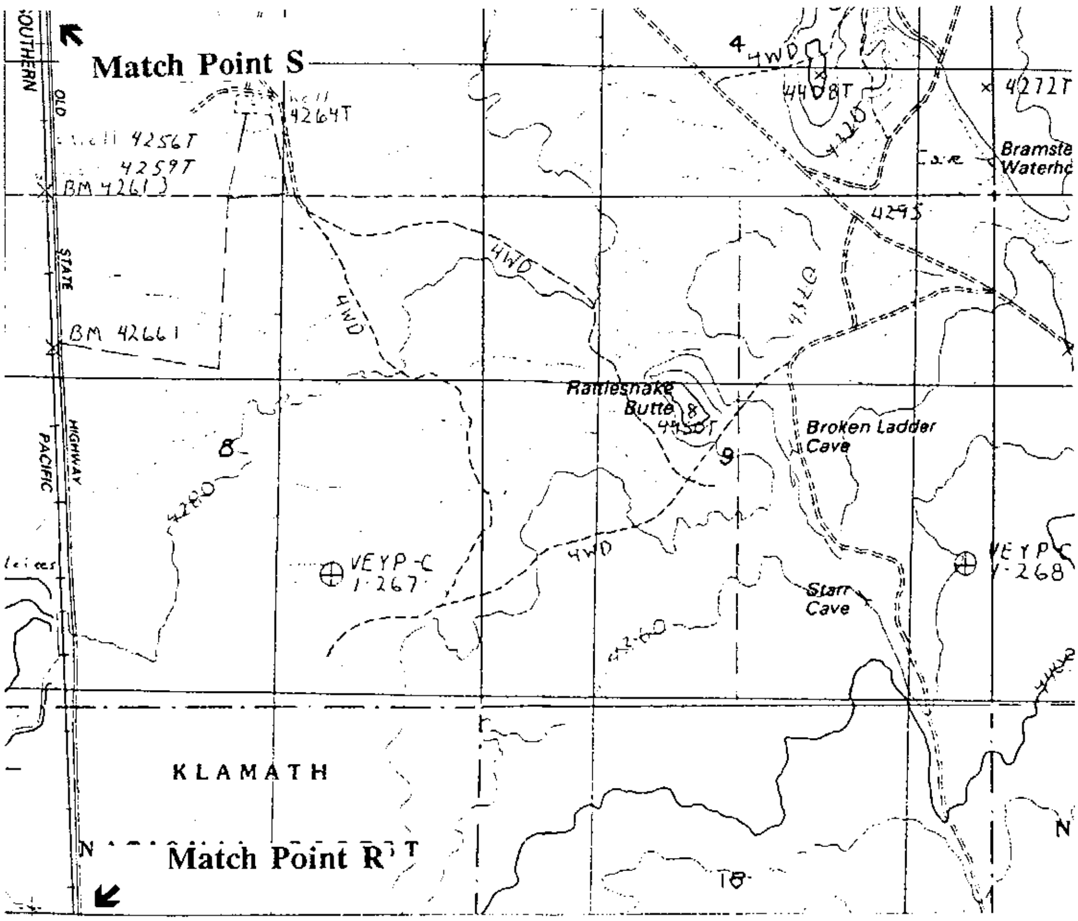

Match Point M
Dead Sheer Flat
4657T
BM 4727.6
FOREST BOUNDARY
Devils Gate
BM 4680T
Match Point N
Creek
Gravel Pit
4697T
4665T
Borrow Pit
Ranch
Cinder Pit
13
18
17
24
19
20

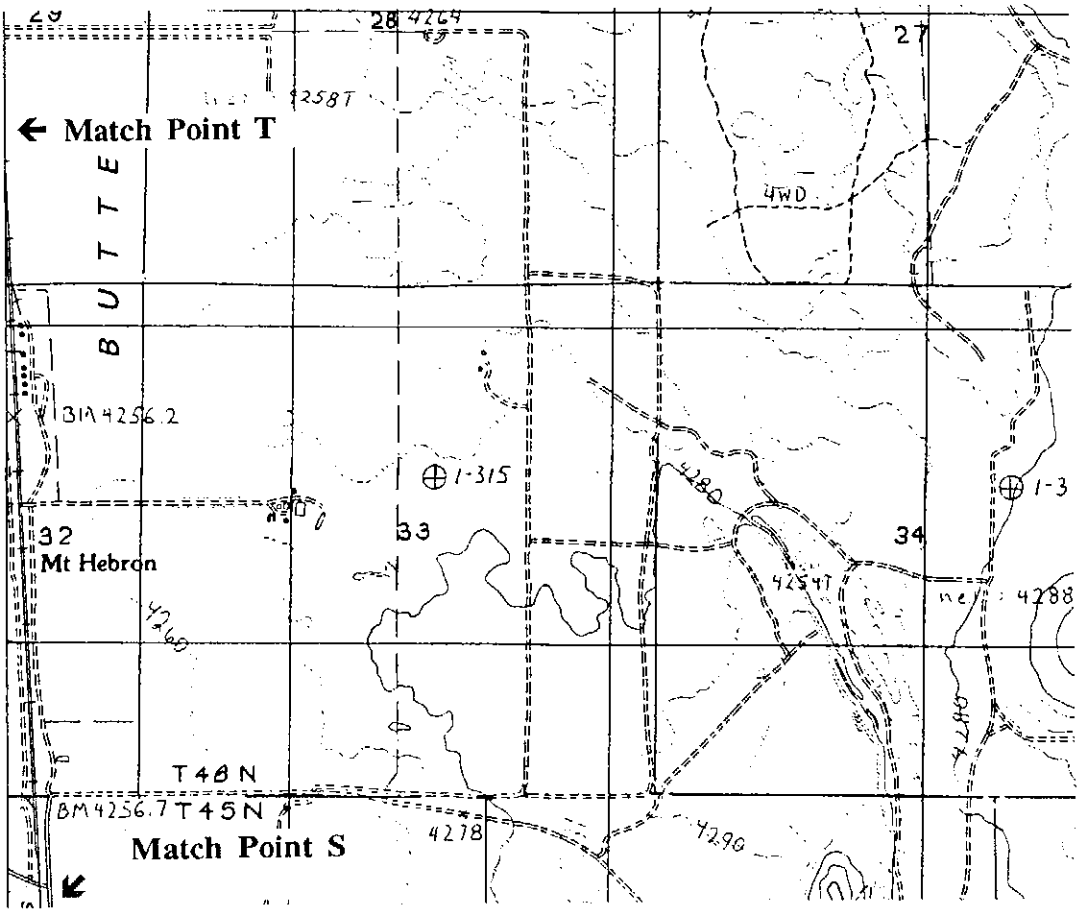

Match Point O
Match Point N
Leaf
Orr Lake
Butte
Creek
Bray
Corral
BM46391
BM46436
4655T
4678T
4654T
4930T
WL4649T
4204
4565T
4585T
4667T
KLAMATH NATIONAL FOREST
BOUNDARY
FOREST
17
16
15
20
21
22

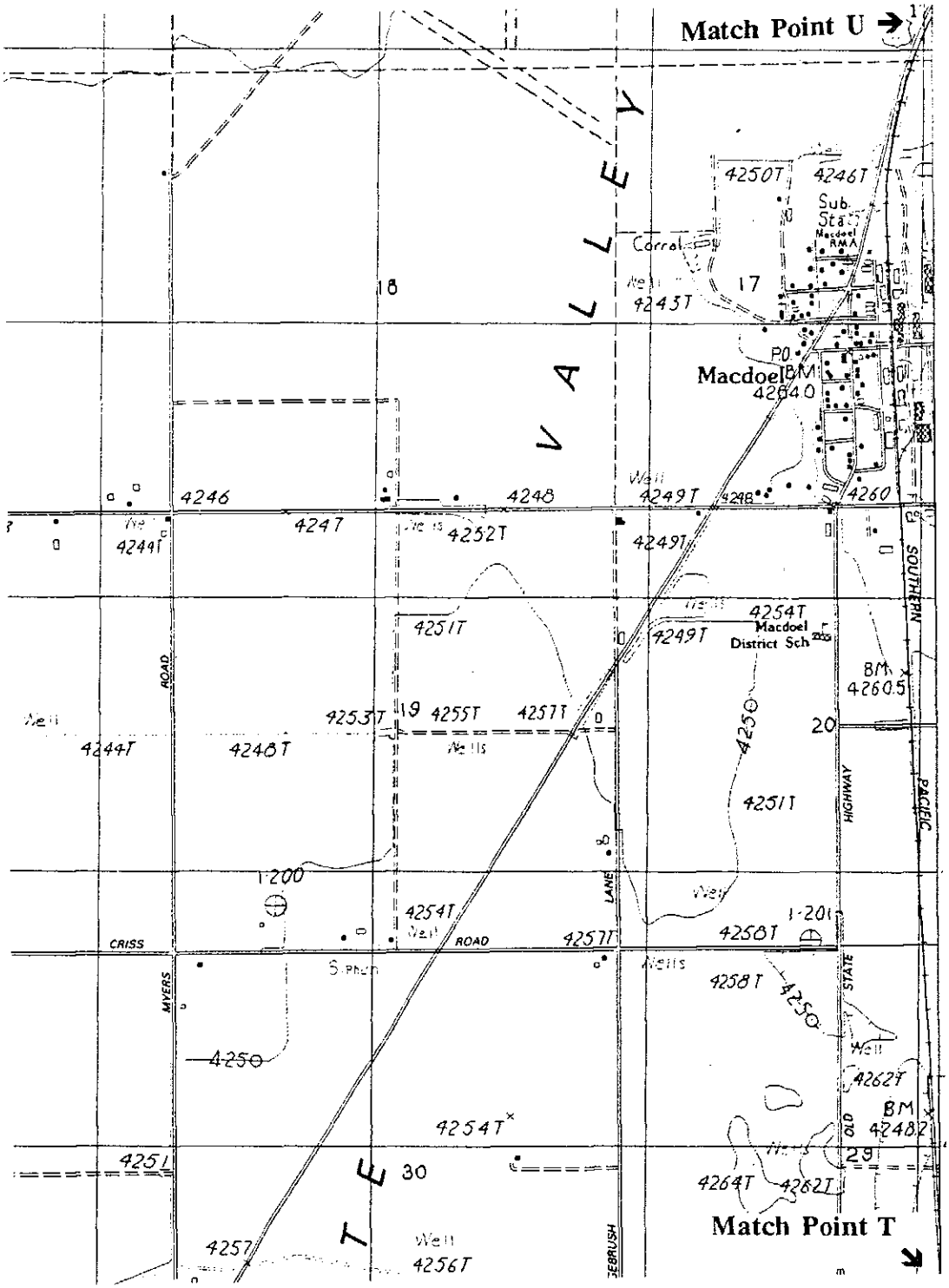

Match Point P
Match Point O
Kegg
4426T
BM4486.5
BM4488.2
Levee
Spillway
Gate
4-205
5303T
5823T
Ort
Mountain
Lookout House
4
3
9

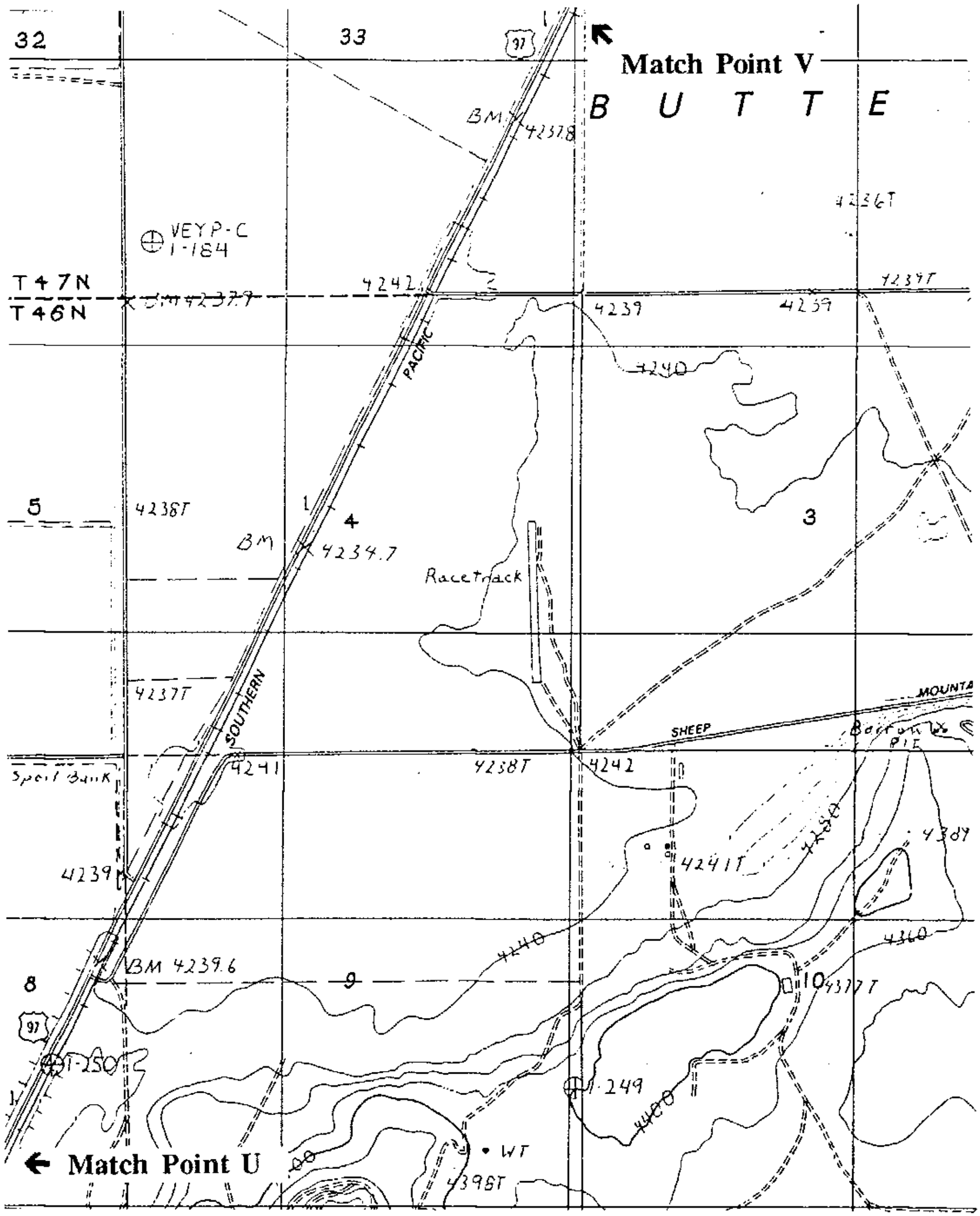

Match Point Q
29
28
FOREST
NATIONAL
Butte
4367T
4207
well 4367T
Shafter
Campground
4470T
4375T
32
BM 4387.3
33
BOUNDARY
T 45 N
T 44 N
4399T
4423T
4402T
Creek
Match Point P

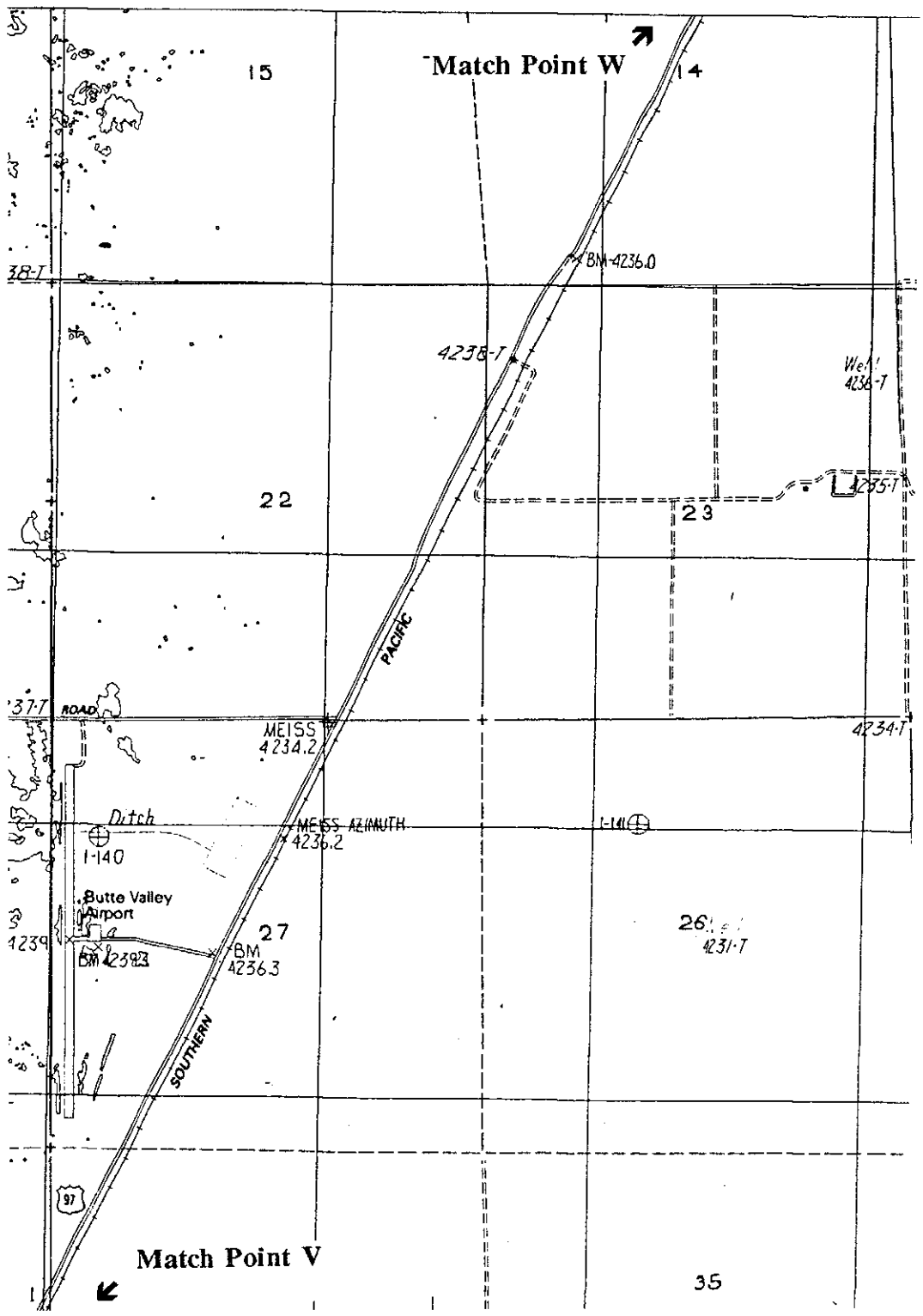

Match Point R
KLAMATH
NATIONAL FOREST
Butte
4512T
East Jerome Butte
BOUNDARY
16
4324T
FOREST
20
21
NATIONAL
4208
4504T
4476T
Water Tanks
4597T
4584T
4591T
Match Point Q

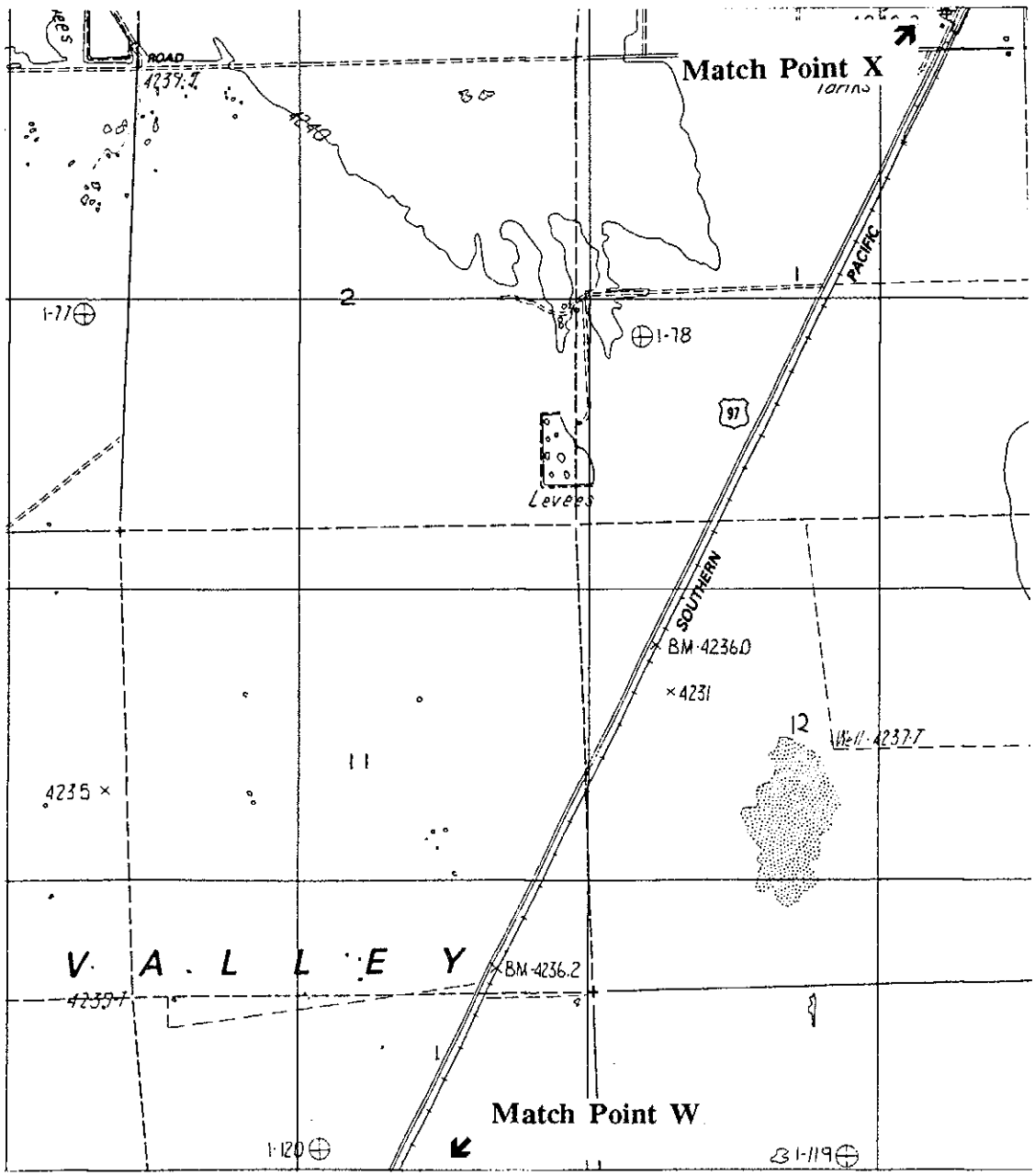

Match Point S
SOUTHERN
OLD
STATE
HIGHWAY
PACIFIC
BM 4261
BM 4266
4264T
4256T
4259T
4WD
4408T
4272T
Bramste
Waterhc
4295
Rattlesnake
Butte
4450T
Broken Ladder
Cave
VEYP-C
Starr
Cave
4280
KLAMATH
Match Point R

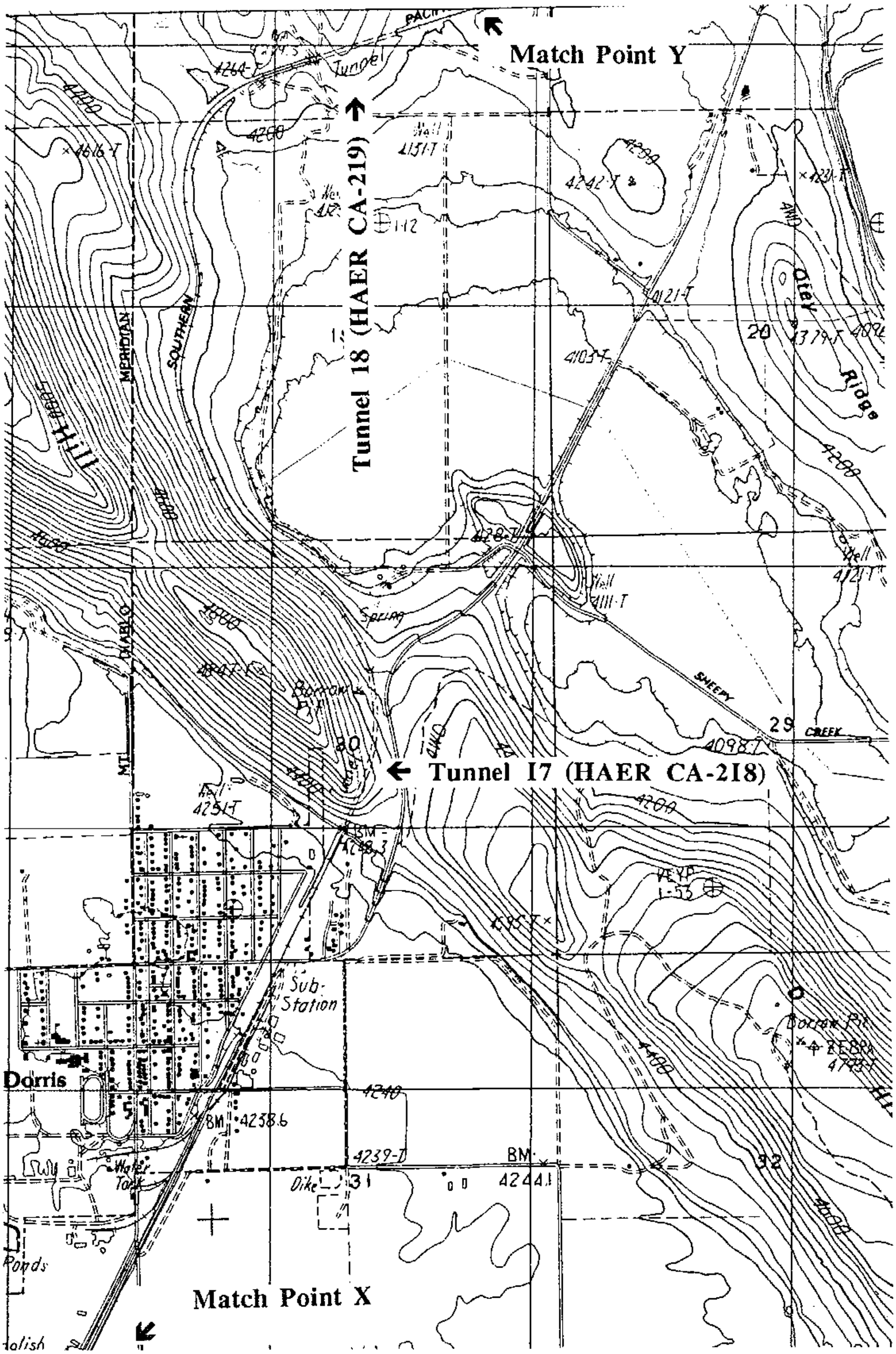

Match Point T
BUTTE
28
27
4WD
BM 4256.2
1-315
1-3
32
Mt Hebron
33
34
4280
4254T
4288
4260
T 46 N
T 45 N
BM 4256.7
4278
4290
Match Point S

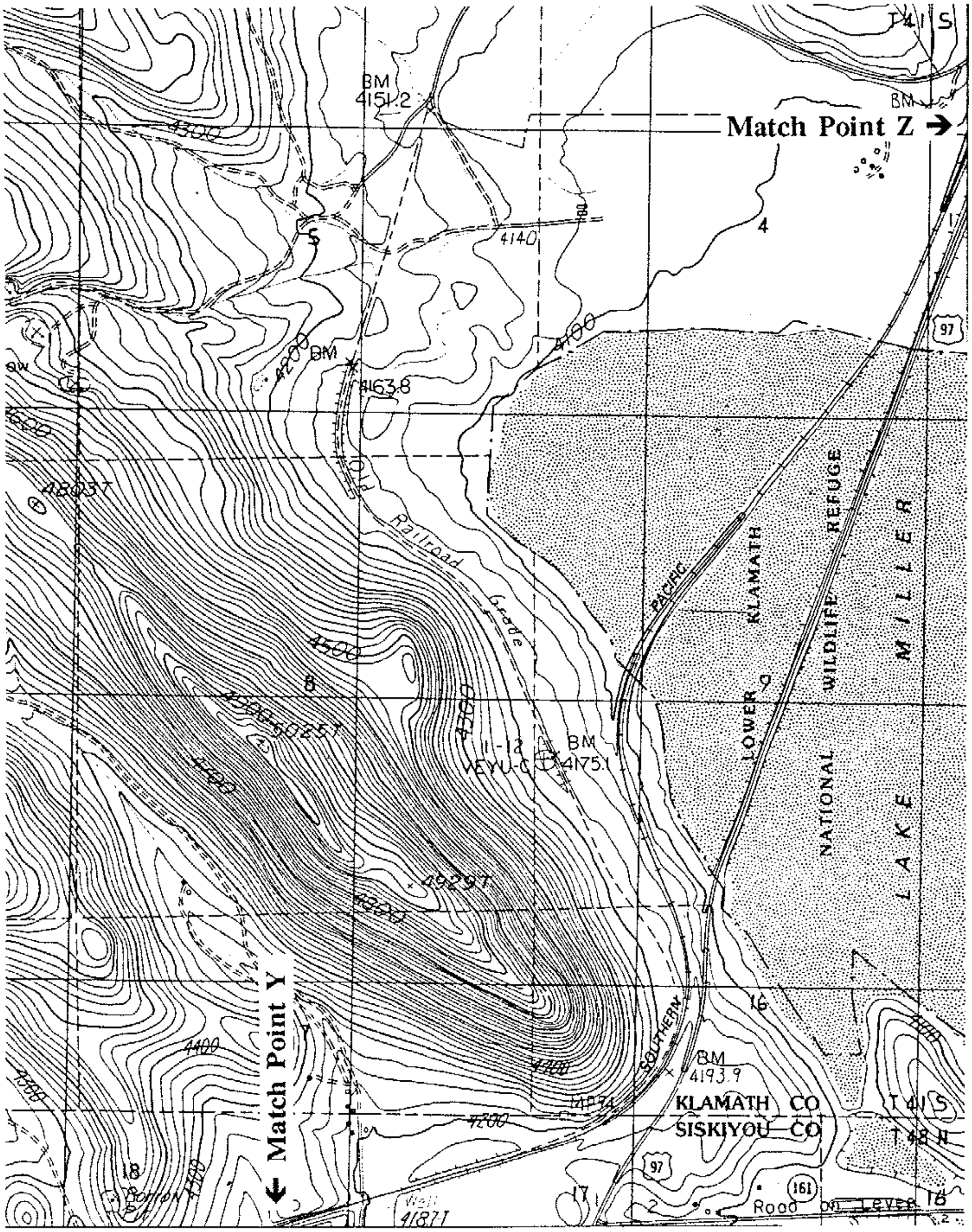

Match Point U
VALLEY
4250T
4246T
Sub. Sta.
Macdoel RMA
Corral
Well
4243T
17
18
P.O.
Macdoel BM
4264.0
4246
4248
Well
4249T
4248
4260
4247
4252T
4249T
SOUTHERN
4251T
4254T
Macdoel
District Sch
4249T
BM
4260.5
ROAD
4253T
19
4255T
4257T
20
4250
4244T
4248T
Wells
4251T
HIGHWAY
PACIFIC
1-200
LANE
Well
1-201
4254T
Well
ROAD
4257T
4258T
CRISS
Siphon
Wells
4258T
4250
MYERS
STATE
4250
Well
4262T
BM
4248.2
OLD
4254T
4251
30
29
4264T
4262T
Match Point T
4257
Well
4256T
TE
ZEBRUSH

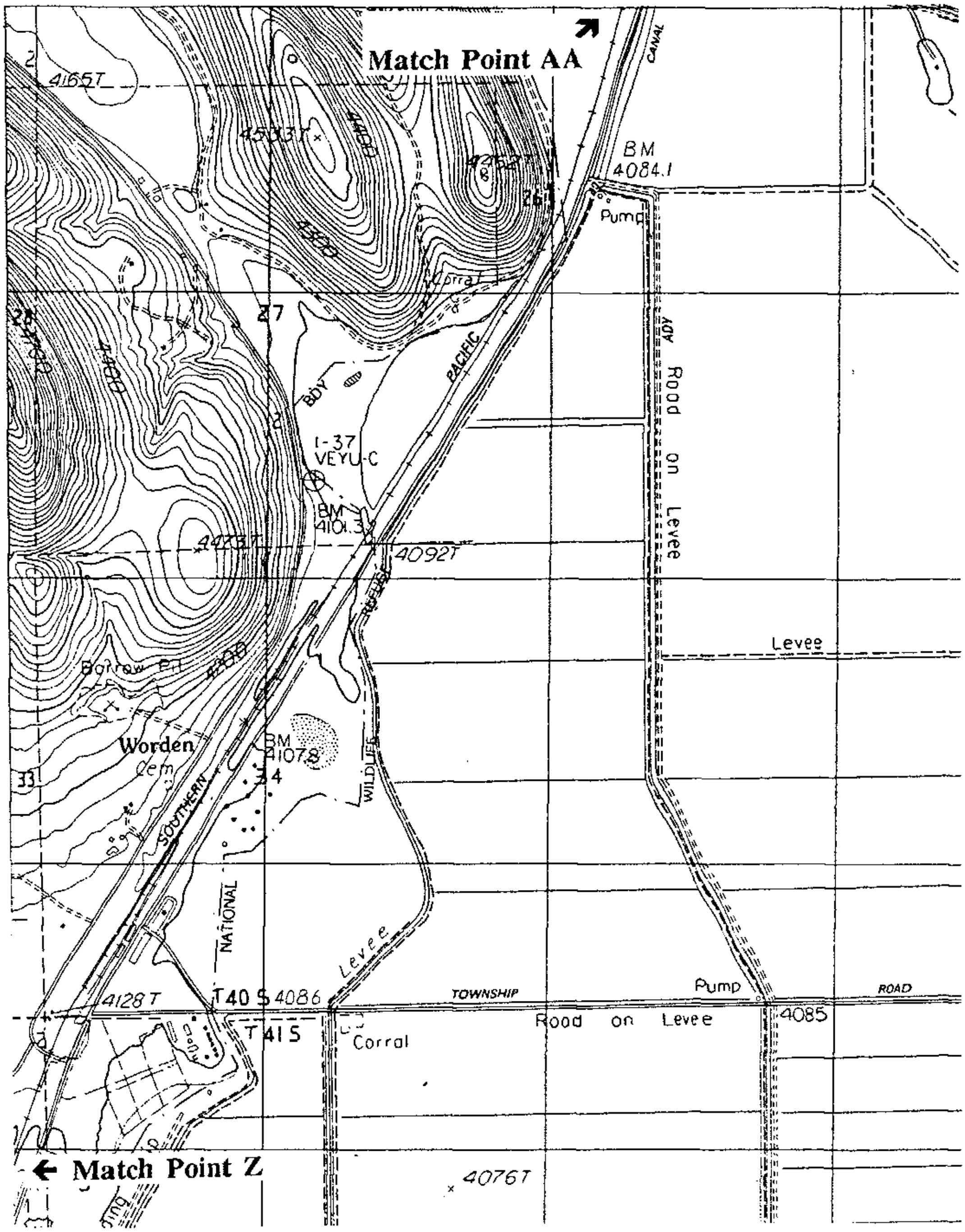

32
33
97
Match Point V
B U T T E
BM 4237.8
4236T
VEYP-C
1-184
T 47 N
T 46 N
4242
4239
4239
4240
PACIFIC
5
4238T
4
3
BM 4234.7
Racetrack
4237T
SOUTHERN
SHEEP
MOUNTA
4241
4238T
4242
Spoil Bank
4241T
4239
BM 4239.6
8
9
10
97
1-250
1-249
WT
4398T
Match Point U

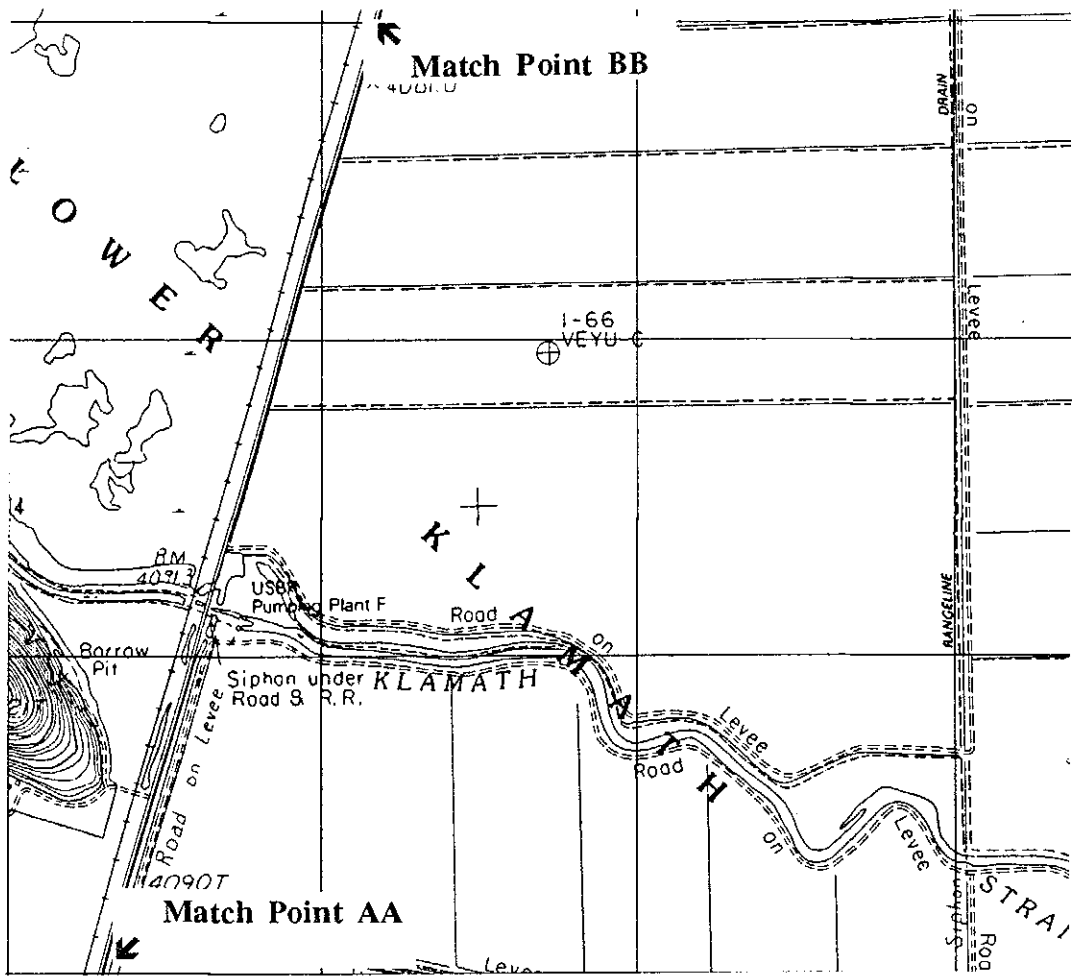

Match Point W
15
14
BM 4236.0
4238-T
22
23
4235-T
4234-T
37-T
ROAD
MEISS
4234.2
PACIFIC
Ditch
MEISS AZIMUTH
4236.2
I-140
Butte Valley
Airport
27
BM
4236.3
4239
26
4231-T
SOUTHERN
97
Match Point V
35

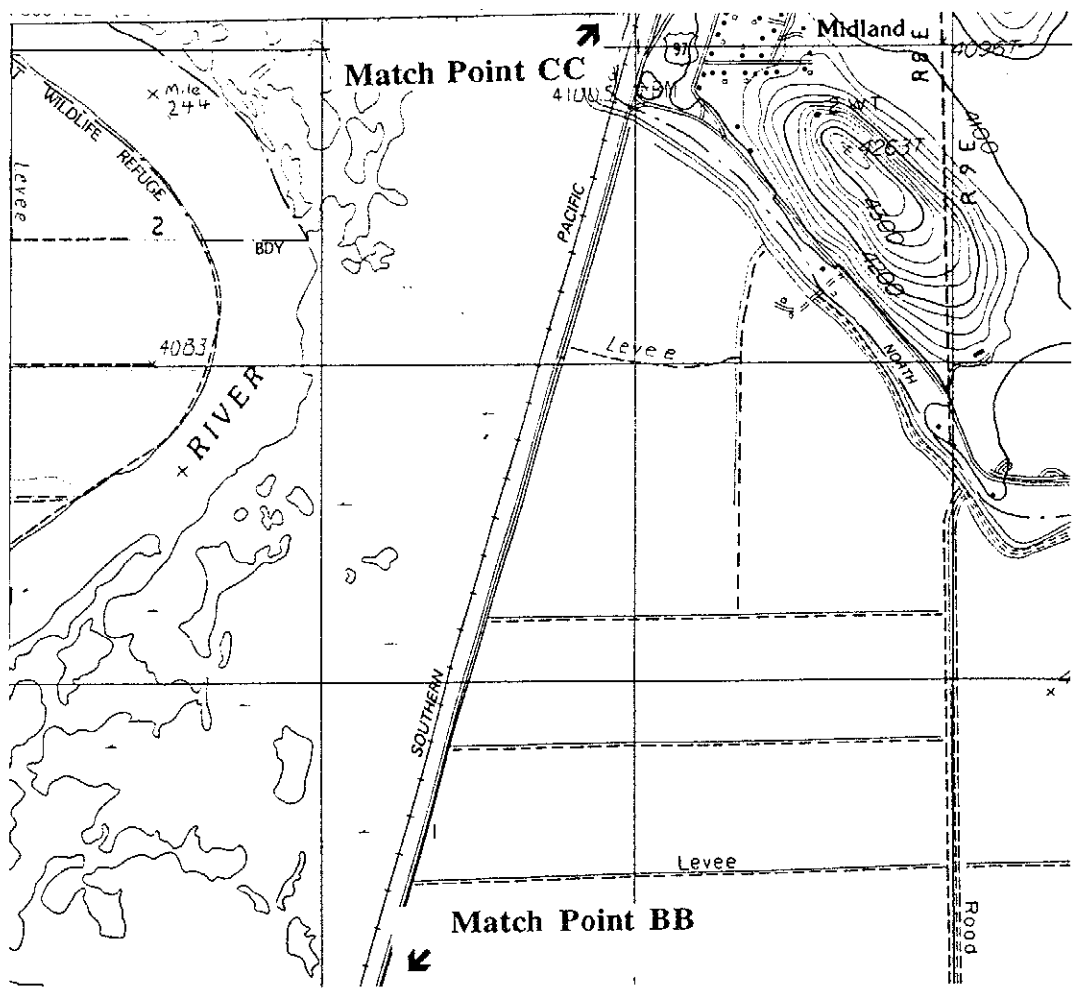

Match Point X
PACIFIC
SOUTHERN
97
Levees
BM 4236.0
4231
4235
BM 4236.2
V A L L E Y
Match Point W
1-77
1-78
1-120
1-119
2
1
11
12

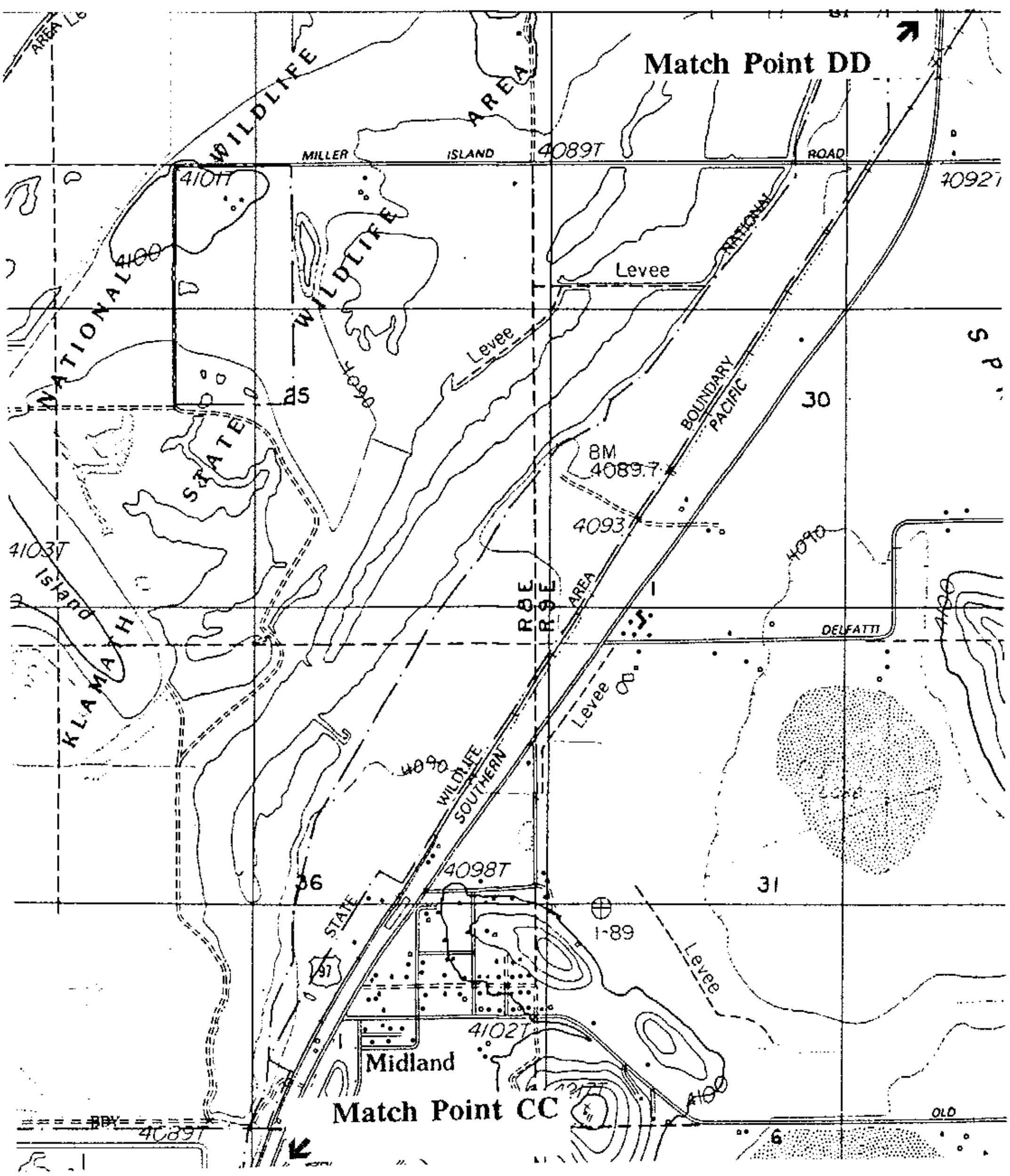

Match Point Y
Tunnel
Tunnel 18 (HAER CA-219)
MERIDIAN
SOUTHERN
DIABLO
Spring
Borrow Pit
Ridge
SHEEPY
CREEK
Tunnel 17 (HAER CA-218)
Sub-Station
Dorris
Water Tank
Dike
Ponds
Match Point X

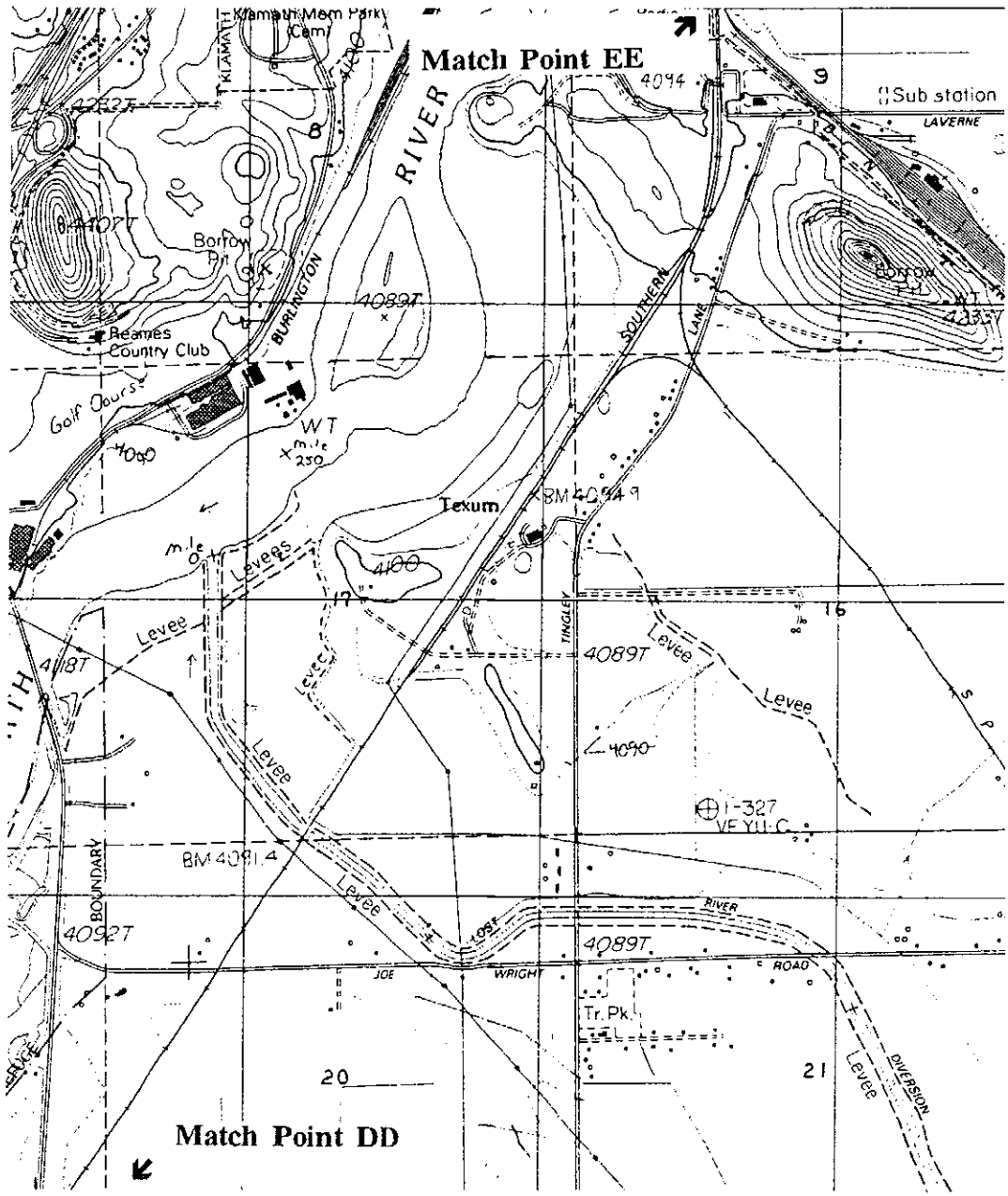

Match Point Z
Match Point Y
BM 4151.2
BM 4163.8
BM 4175.1
BM 4193.9
4300
4140
4200
4100
4500
4800
4929T
4400
Old Railroad Grade
Southern Pacific
Lower Klamath National Wildlife Refuge
Miller Lake
Klamath Co
Siskiyou Co
T 41 S
T 48 N
97
161
Road on Levee

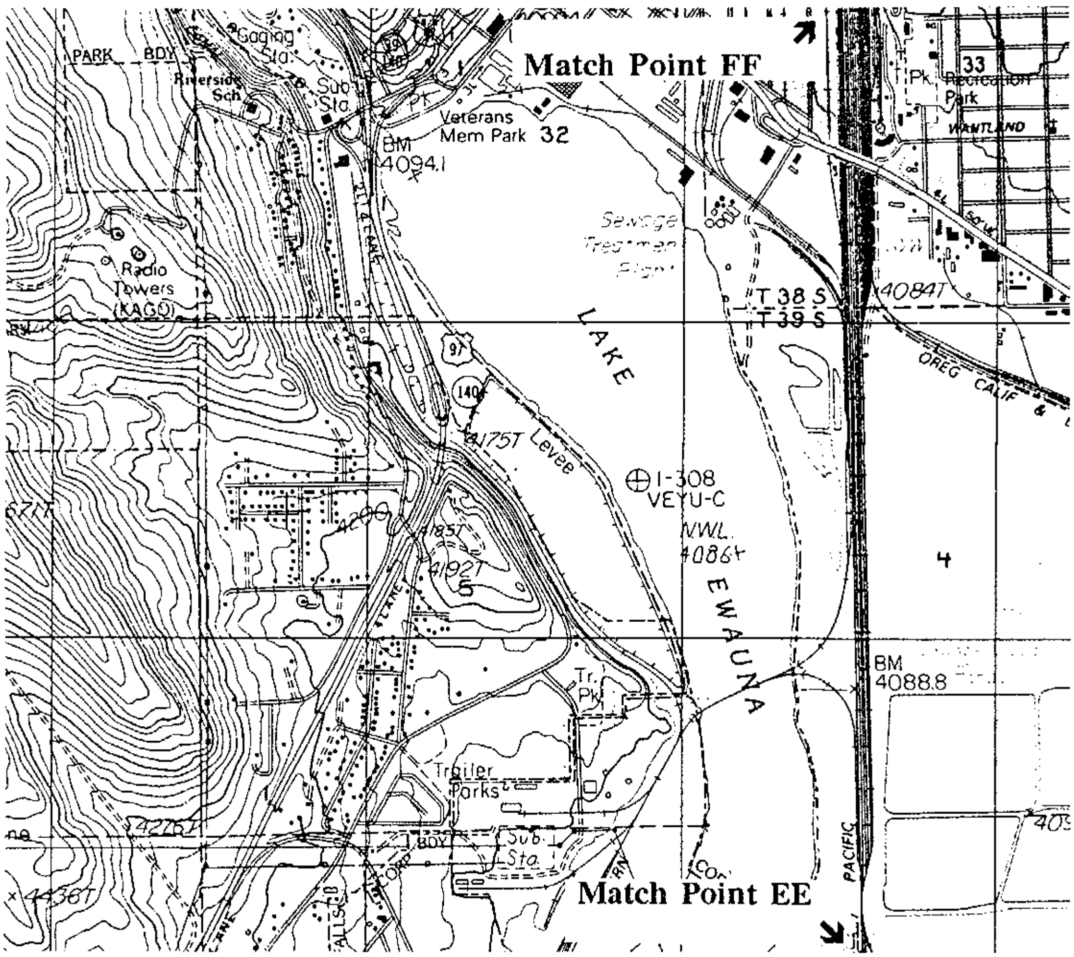

Match Point AA
CANAL
4165T
4533T
4452T
BM
4084.1
Pump
Corral
PACIFIC
Bdy
I-37
VEYU-C
BM
4101.3
4473T
4092T
Road on Levee
Levee
Borrow Pit
Worden
Cem
BM
4107.8
SOUTHERN
WILDLIFE
NATIONAL
Levee
4128 T
T 40 S 4086
TOWNSHIP
ROAD
Pump
4085
T 41 S
Corral
Road on Levee
Match Point Z
4076T

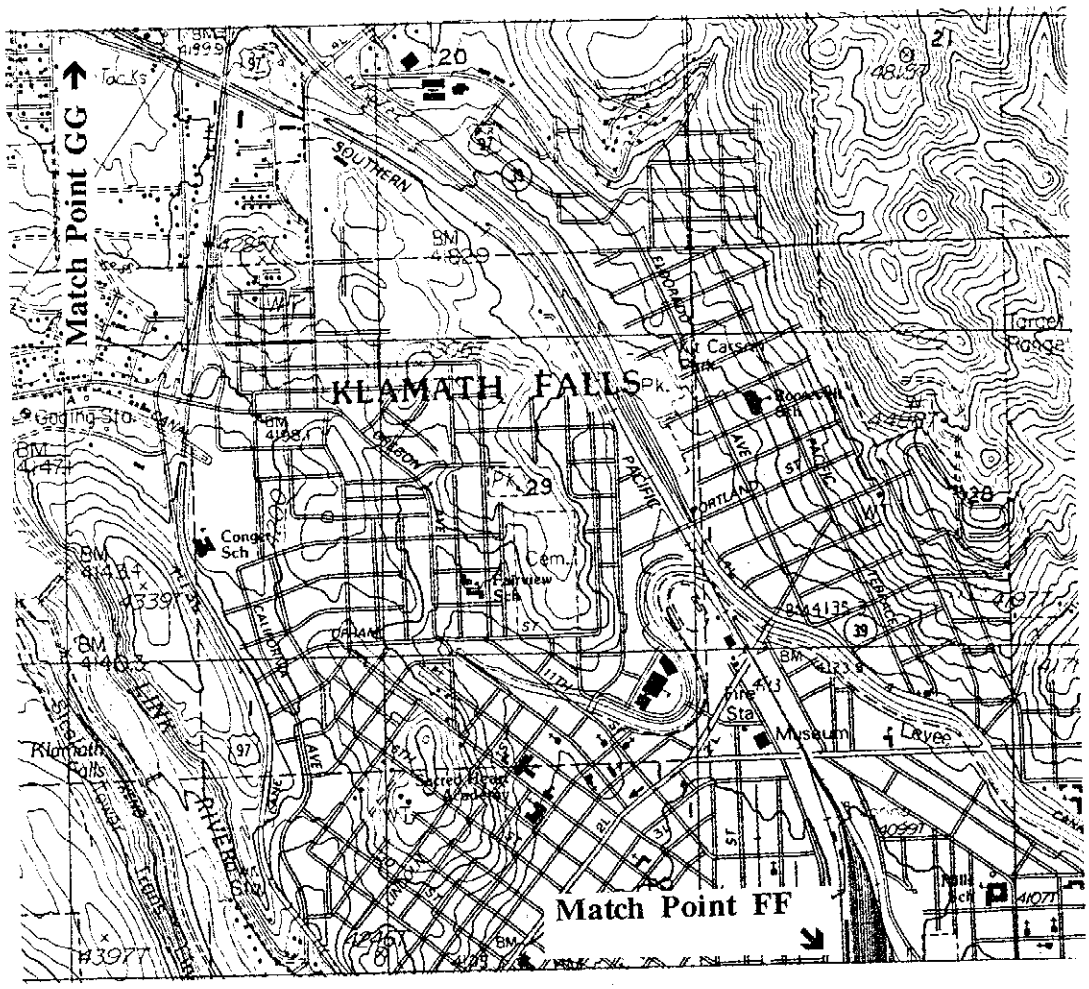

Match Point BB
LOWER
I-66
VEYU-C
Levee
DRAIN
RANGELINE
KLAMATH
BM
4091.3
USBR
Pumping Plant F
Road
Borrow
Pit
Siphon under
Road & R.R.
KLAMATH
Road
Levee
on
Road on Levee
4090T
Match Point AA
STRAI

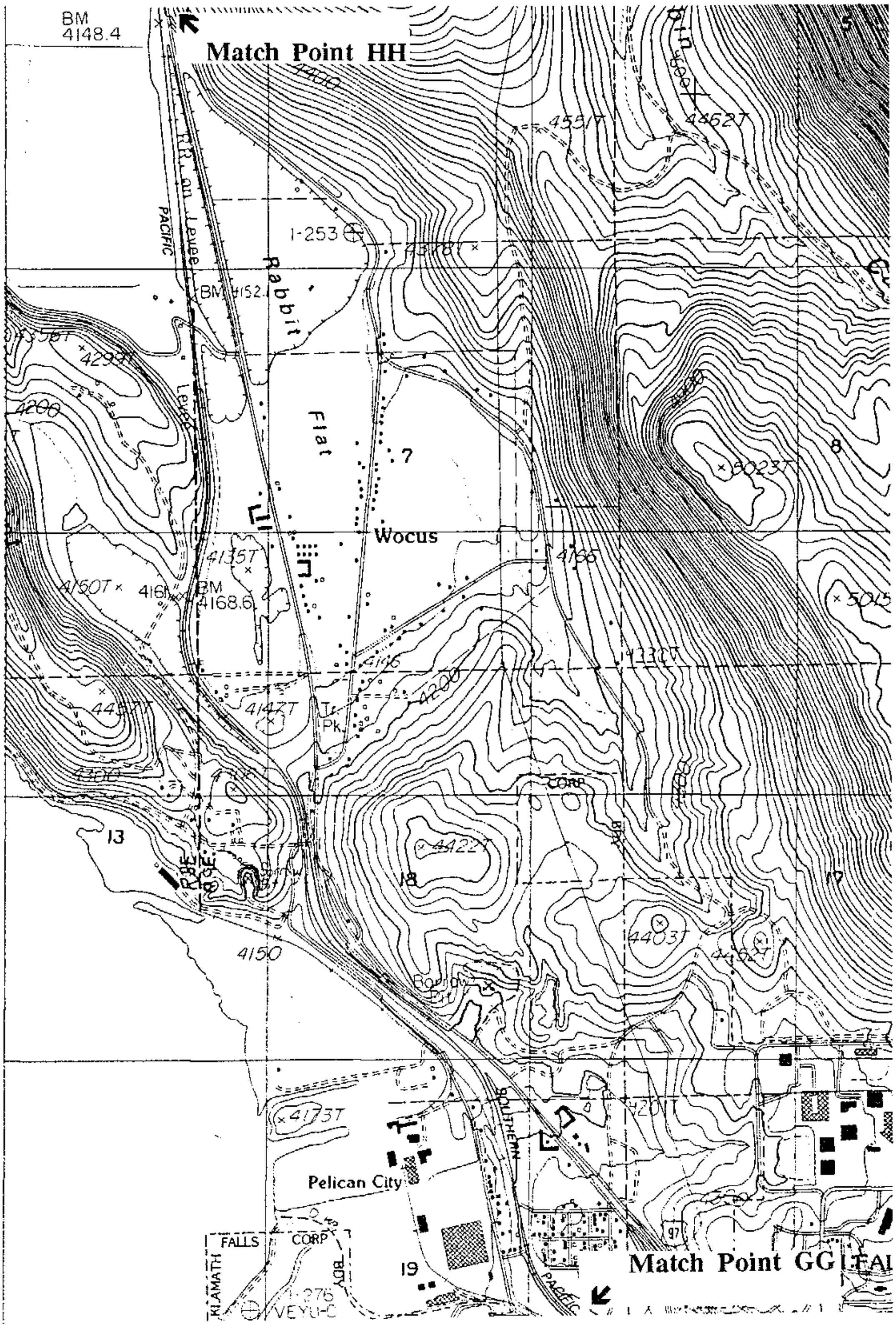

Match Point CC
Midland
WILDLIFE REFUGE
Levee
BDY
4083
RIVER
PACIFIC
SOUTHERN
Levee
NORTH
Levee
Match Point BB
Road

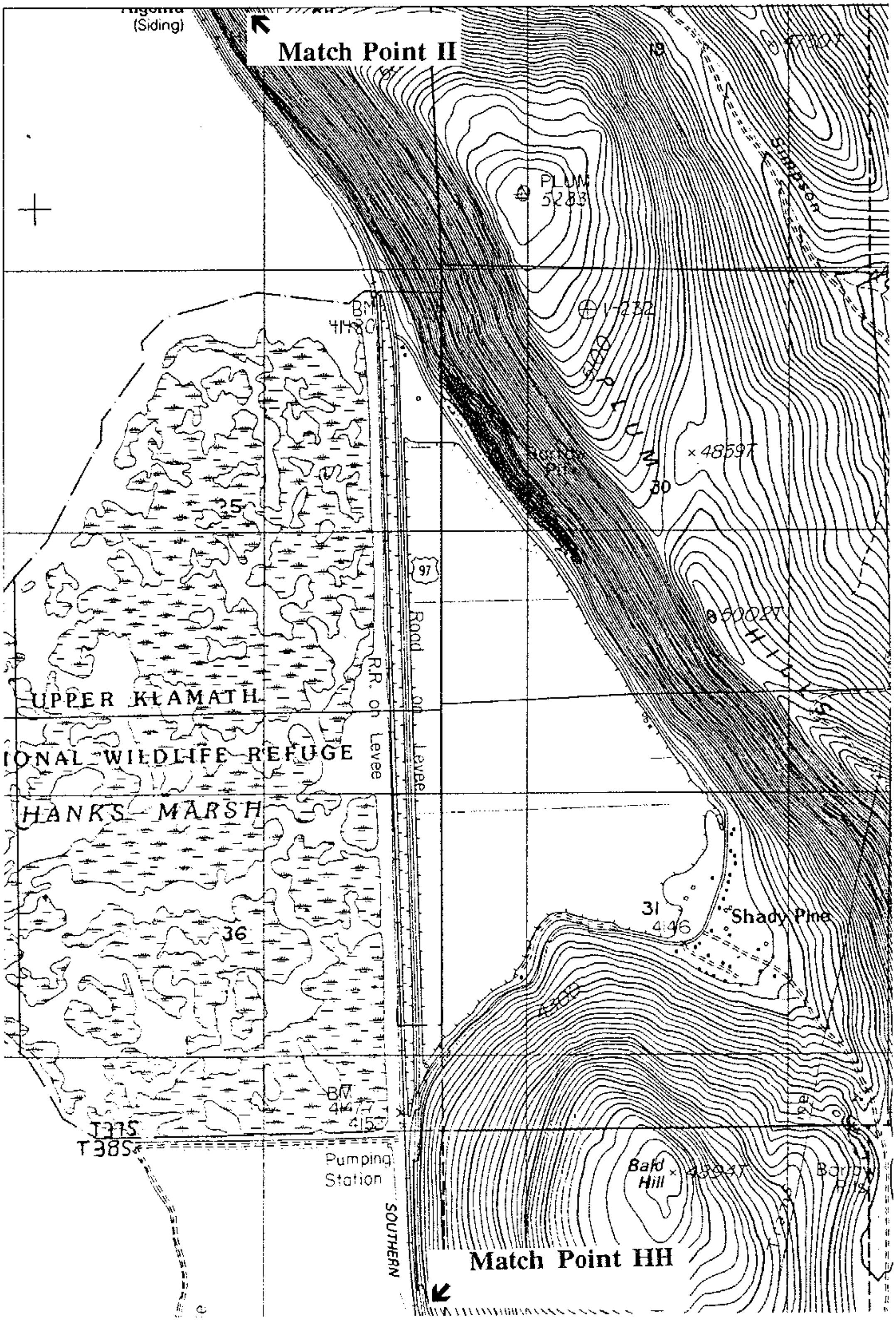

Match Point DD
MILLER ISLAND ROAD
4089T
4092T
4101T
4100
NATIONAL WILDLIFE AREA
WILDLIFE
Levee
BOUNDARY
PACIFIC
NATIONAL
35
30
BM 4089.7
4093
4090
4103T
Island
KLAMATH
STATE
R8E
R9E
AREA
DELFATTI
WILDLIFE
SOUTHERN
STATE
4098T
36
31
1-89
97
4102T
Midland
Match Point CC
4100
4089T
OLD
6

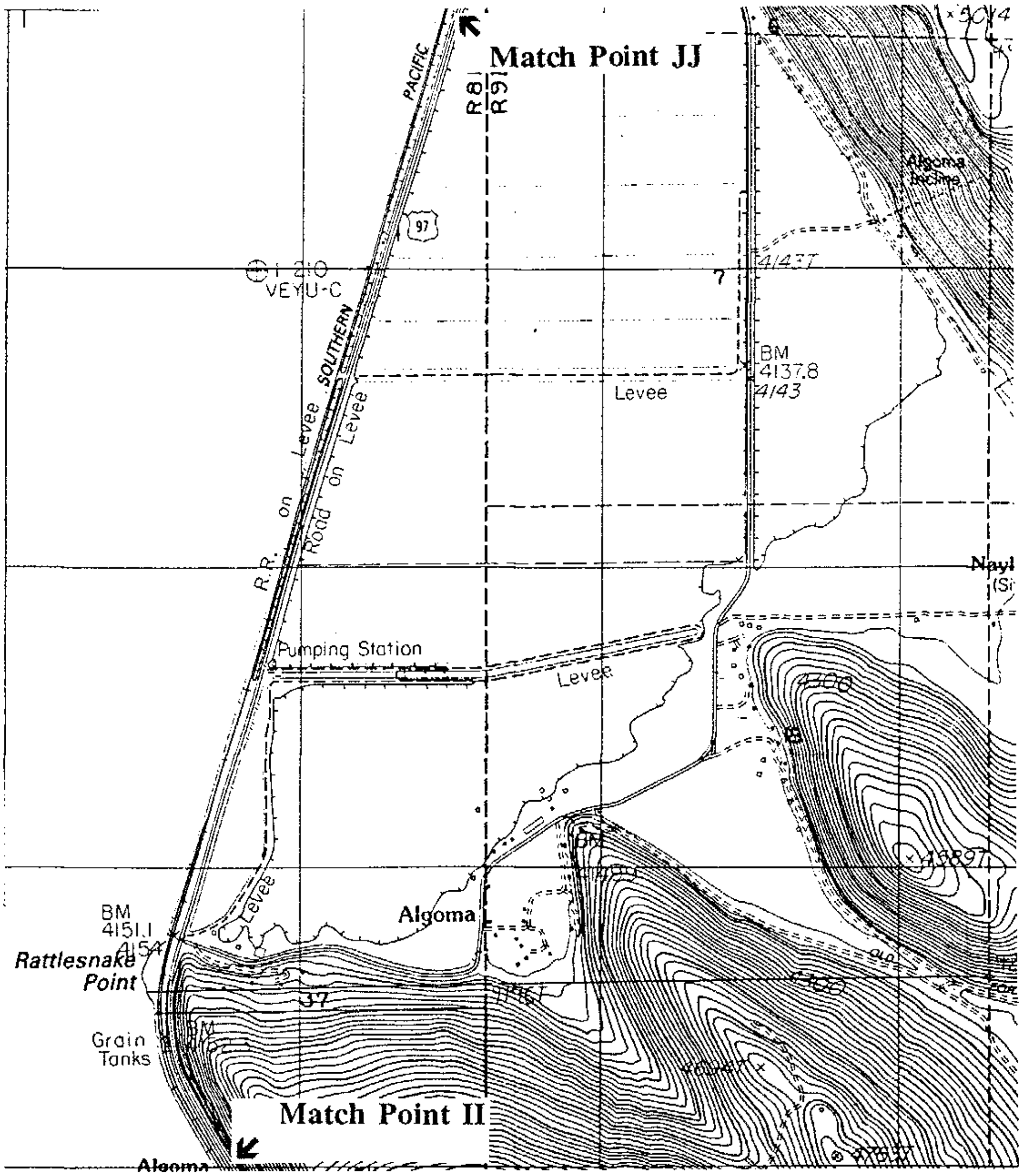

Match Point EE
Match Point DD
Klamath Mem Park
Camp
KLAMATH
RIVER
Sub station
LAVERNE
Borrow Pit
BURLINGTON
SOUTHERN
LANE
Reames Country Club
Golf Cours
WT
Texum
BM 4094.9
Levees
Levee
TINGLE
I-327
VE YU C
BM 4091.4
BOUNDARY
JOE WRIGHT
ROAD
Tr. Pk.
DIVERSION
20
21
16
17

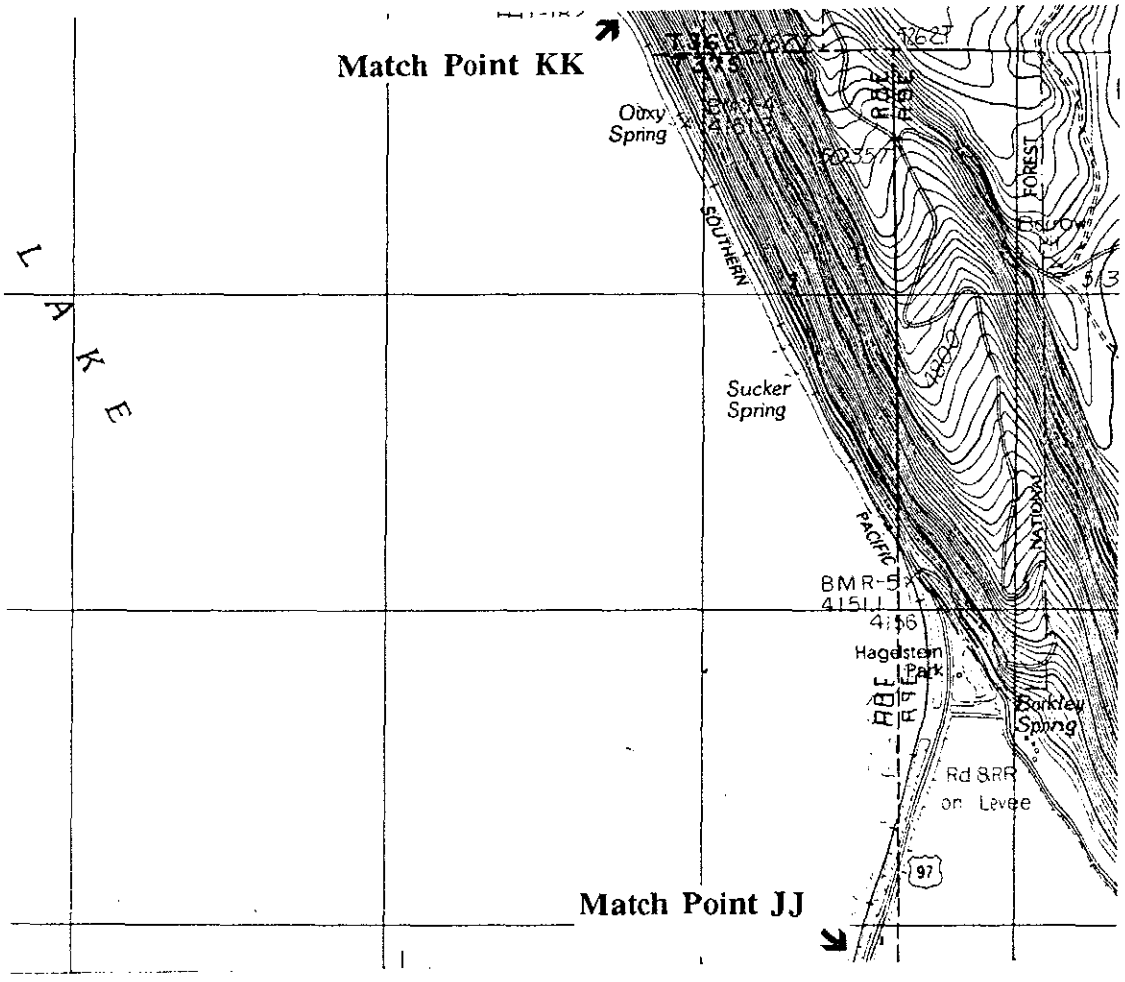

Match Point FF
Match Point EE
Gaging Sta.
Riverside Sch
Sub Sta.
Veterans Mem Park
BM 4094.1
Radio Towers (KAGO)
Sewage Treatment Plant
Recreation Park
LAKE
EWAUNA
Levee
T 38 S
T 39 S
Tr. Pk
Trailer Parks
Sub Sta.
BM 4088.8
PACIFIC

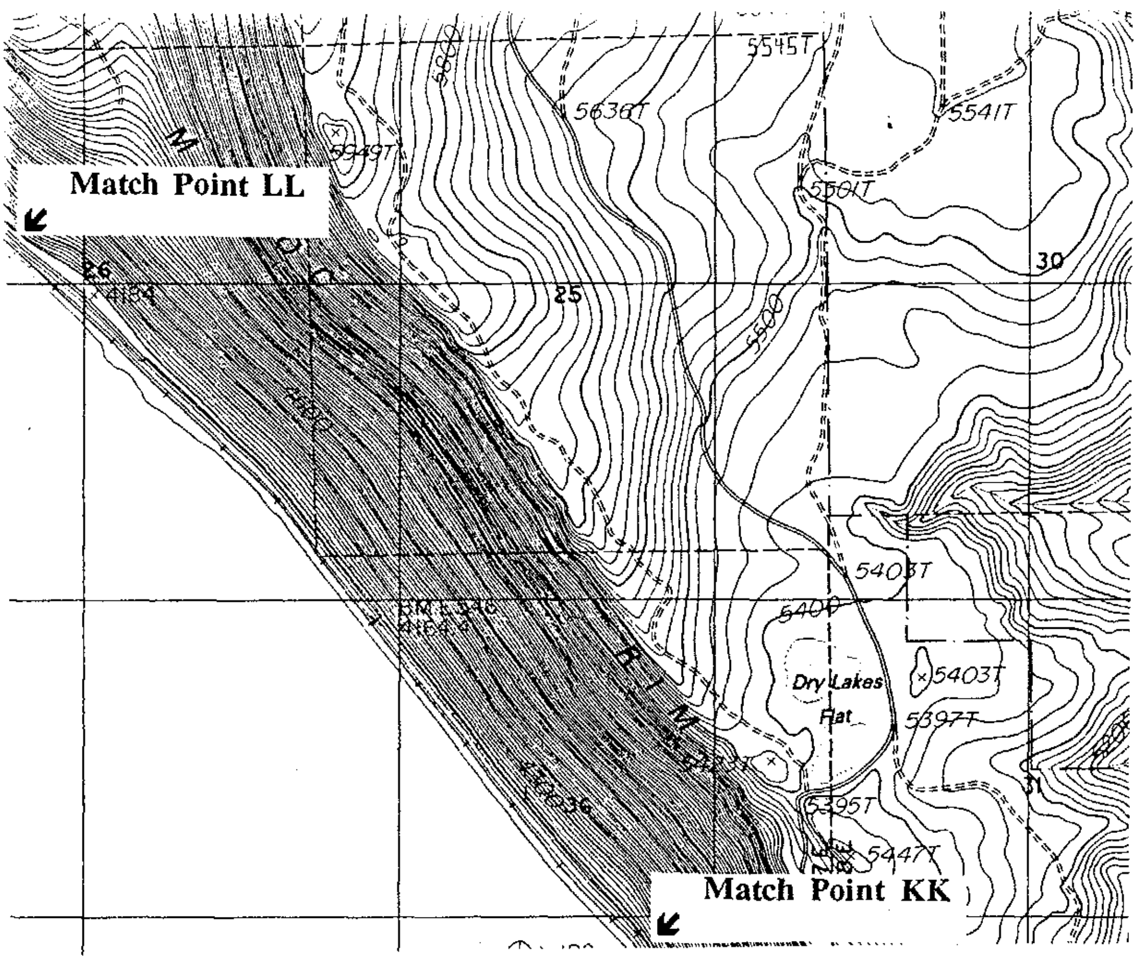

Match Point GG
KLAMATH FALLS
Match Point FF

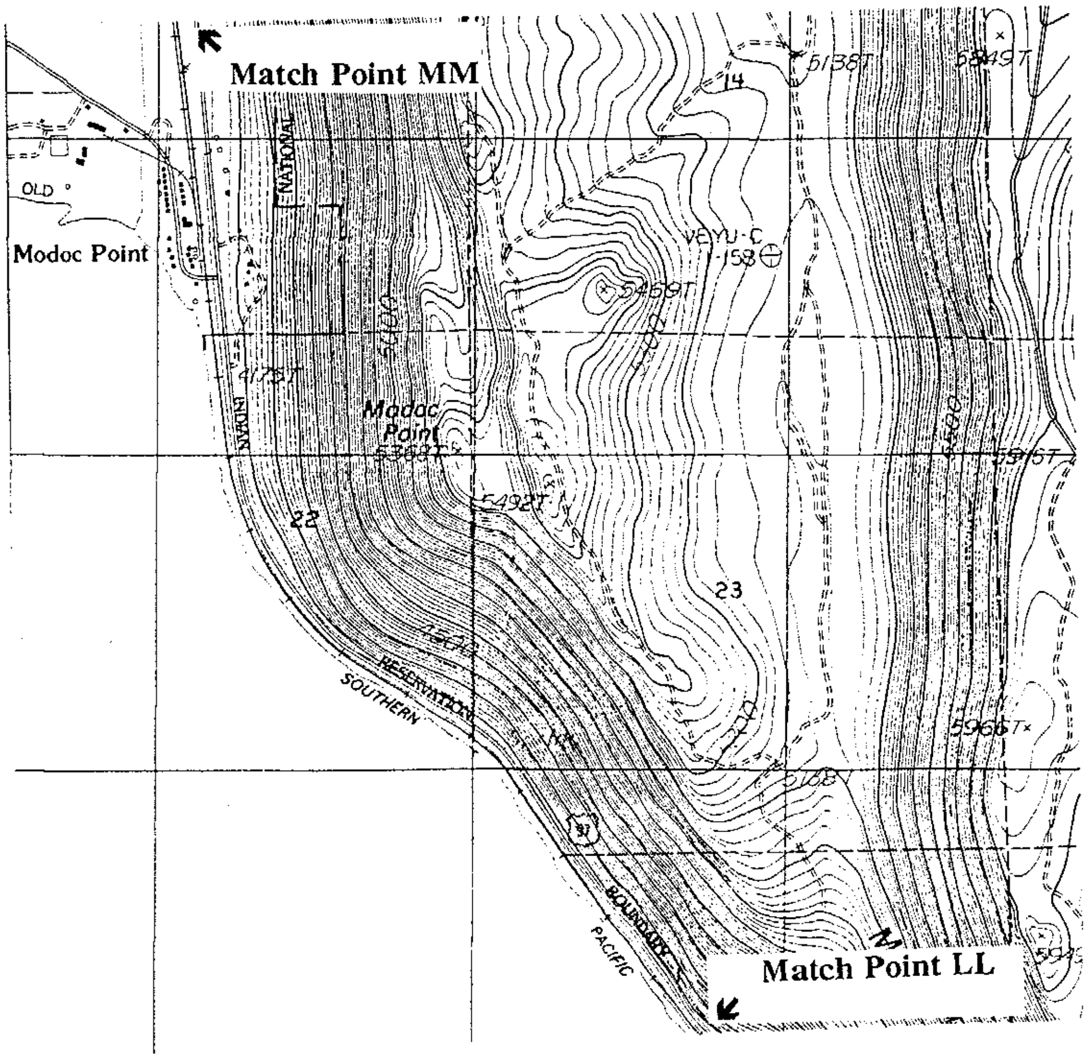

BM
4148.4
Match Point HH
4300
4551T
4462T
PACIFIC
1-253
Rabbit
BM 4152
4299T
4200
Levee
Flat
7
5023T
8
Wocus
4135T
4166
4150T
4161
BM
4168.6
5015
4196
4200
4447T
4147T
Tr. Pk.
4300
CORP
13
18
4422T
17
4150
4403T
4462T
Borrow Pit
4173T
SOUTHERN
4201T
Pelican City
FALLS
CORP
KLAMATH
BDY
19
1-276
VEYU-C
97
Match Point GG

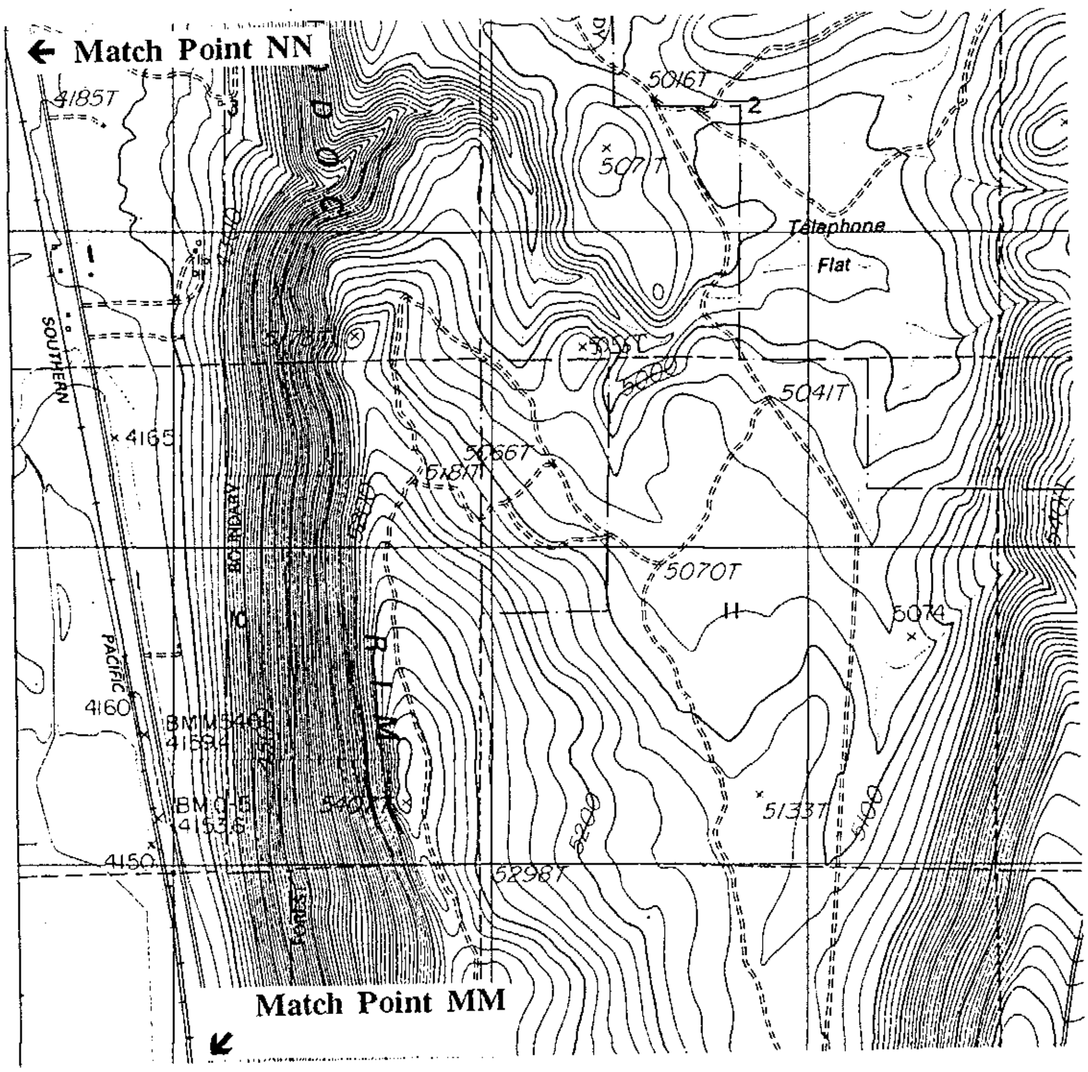

(Siding)
Match Point II
PLUM
5283
UPPER KLAMATH
IONAL WILDLIFE REFUGE
HANKS MARSH
25
36
31
R.R. on Levee
Road on Levee
97
Shady Pine
Pumping Station
SOUTHERN
Bald Hill
T37S
T38S
Match Point HH

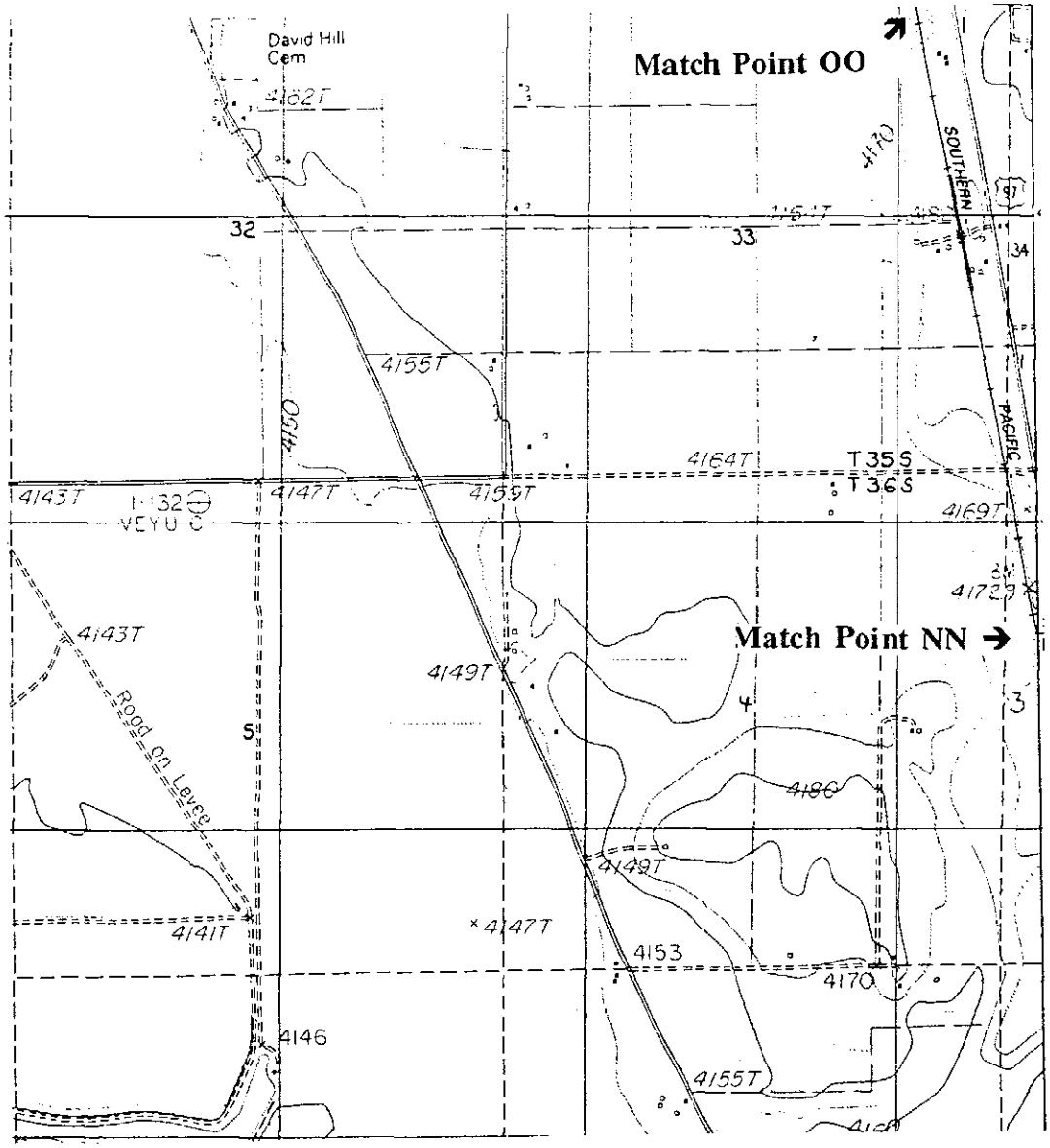

Match Point JJ
R8 | R9
PACIFIC
SOUTHERN
97
VEYU-C
Algoma Incline
4143T
BM 4137.8
4143
Levee
R.R. on Levee
Road on Levee
Pumping Station
Levee
Algoma
BM 4151.1
4154
Rattlesnake Point
Grain Tanks
Match Point II

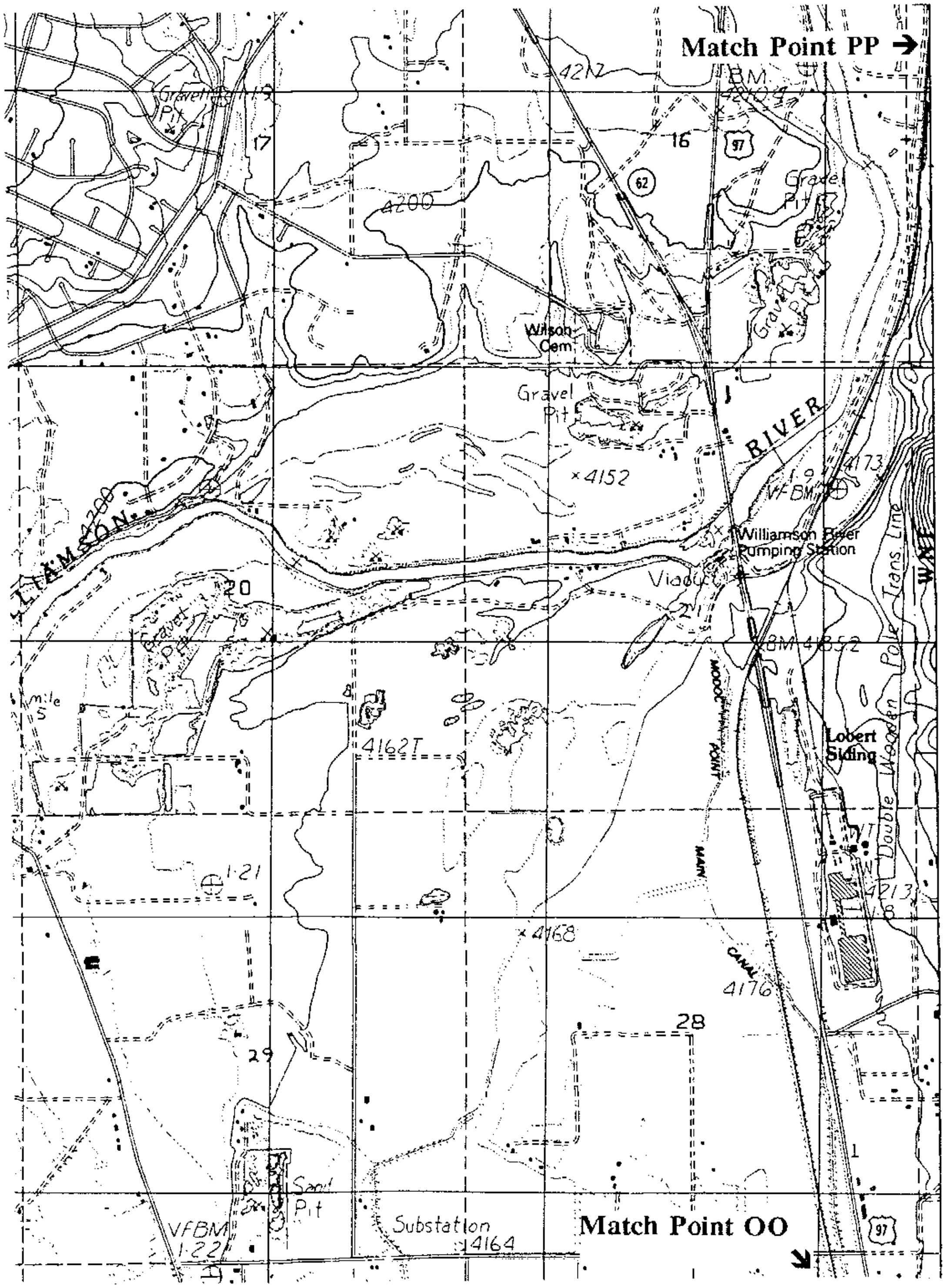

Match Point KK
Oxxy Spring
SOUTHERN PACIFIC R.R.
FOREST
Sucker Spring
PACIFIC
NATIONAL
BMR-5
4151
4156
Hagelstein Park
Barkley Spring
Rd & RR on Levee
97
Match Point JJ
L A K E

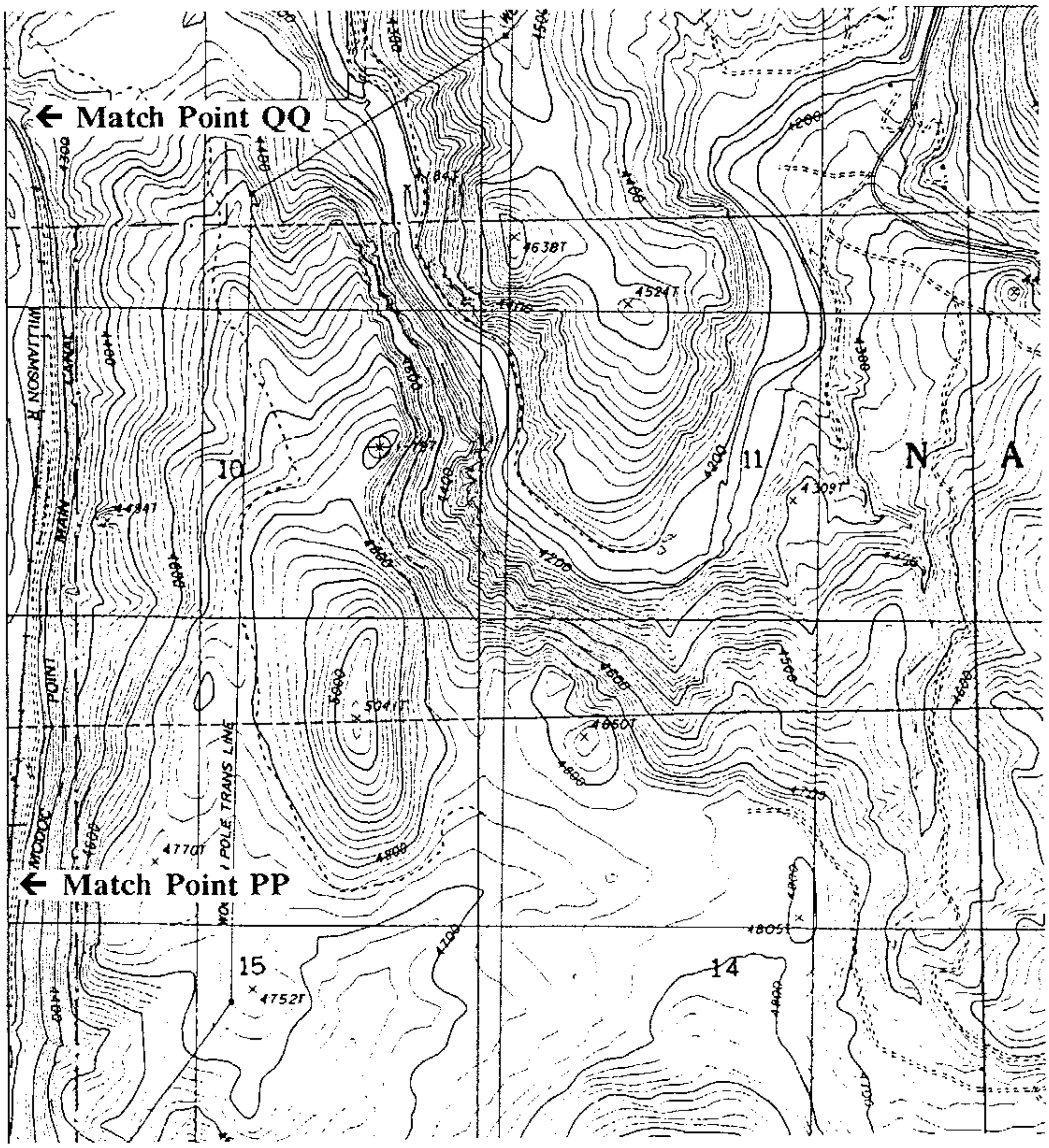

Match Point LL
Match Point KK
5545T
5636T
5541T
5549T
5501T
30
26
25
5500
5403T
5400
Dry Lakes
Flat
5397T
5395T
5447T
31

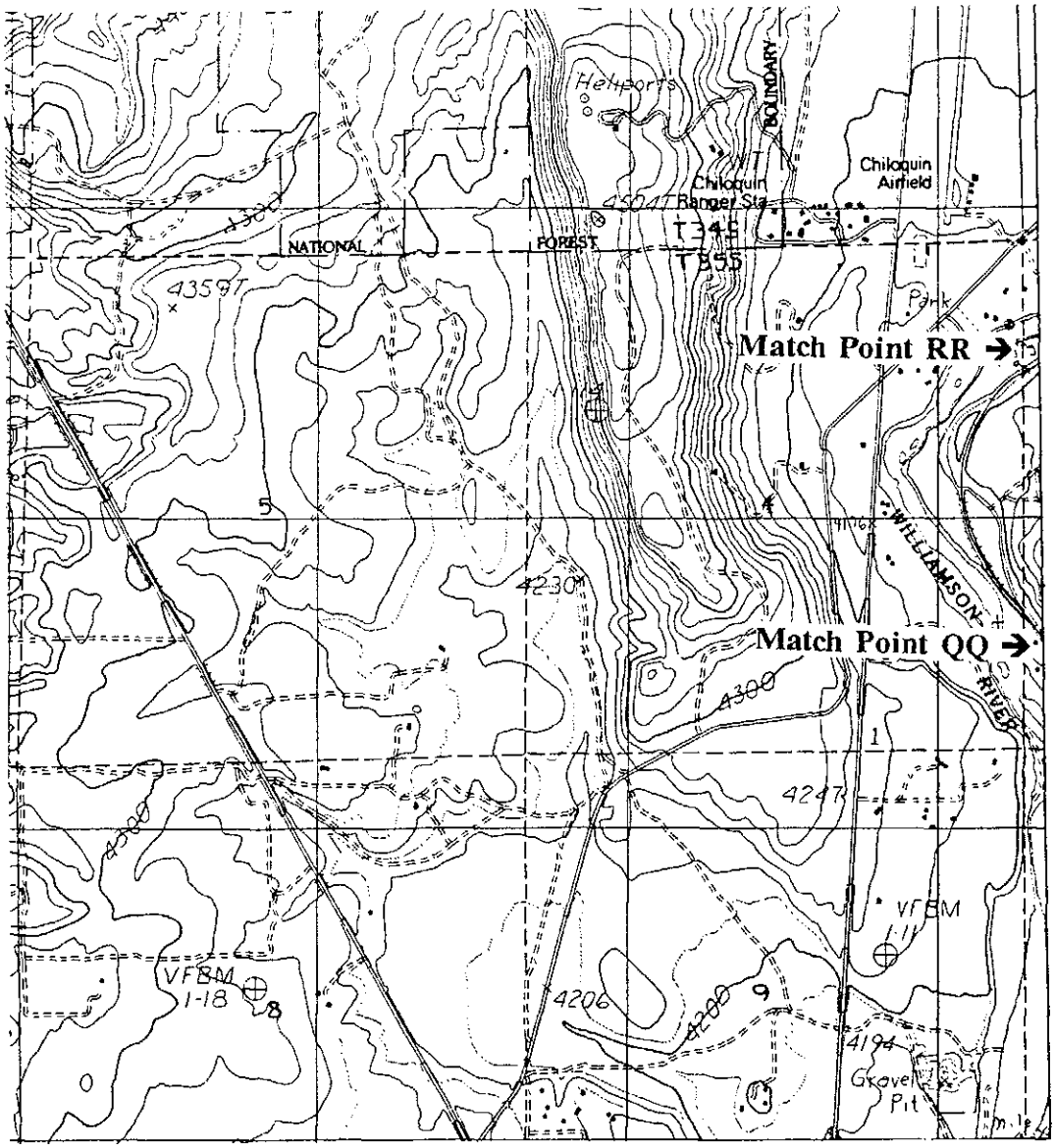

Match Point MM
Modoc Point
OLD
NATIONAL
INDIAN
Modoc Point
5369T
5492T
5469T
VEYU-C
158
5138T
22
23
RESERVATION
SOUTHERN
BOUNDARY
PACIFIC
97
Match Point LL

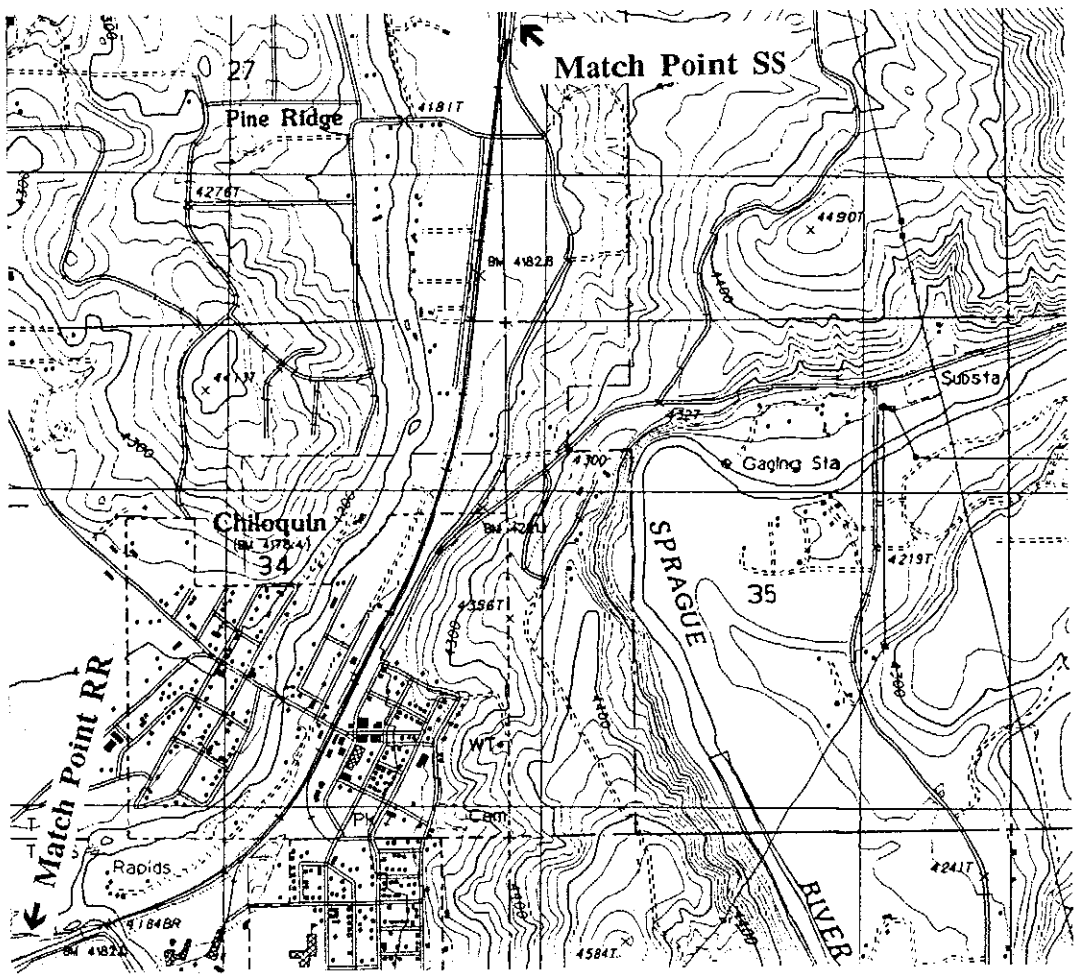

← Match Point NN
4185T
5016T
5071T
Telephone
Flat
SOUTHERN
4165
5041T
5070T
5074
PACIFIC
4160
BM M 5406
4159.4
BM 0-5
4153.6
4150
5133T
5200
5100
5298T
BOUNDARY
Match Point MM

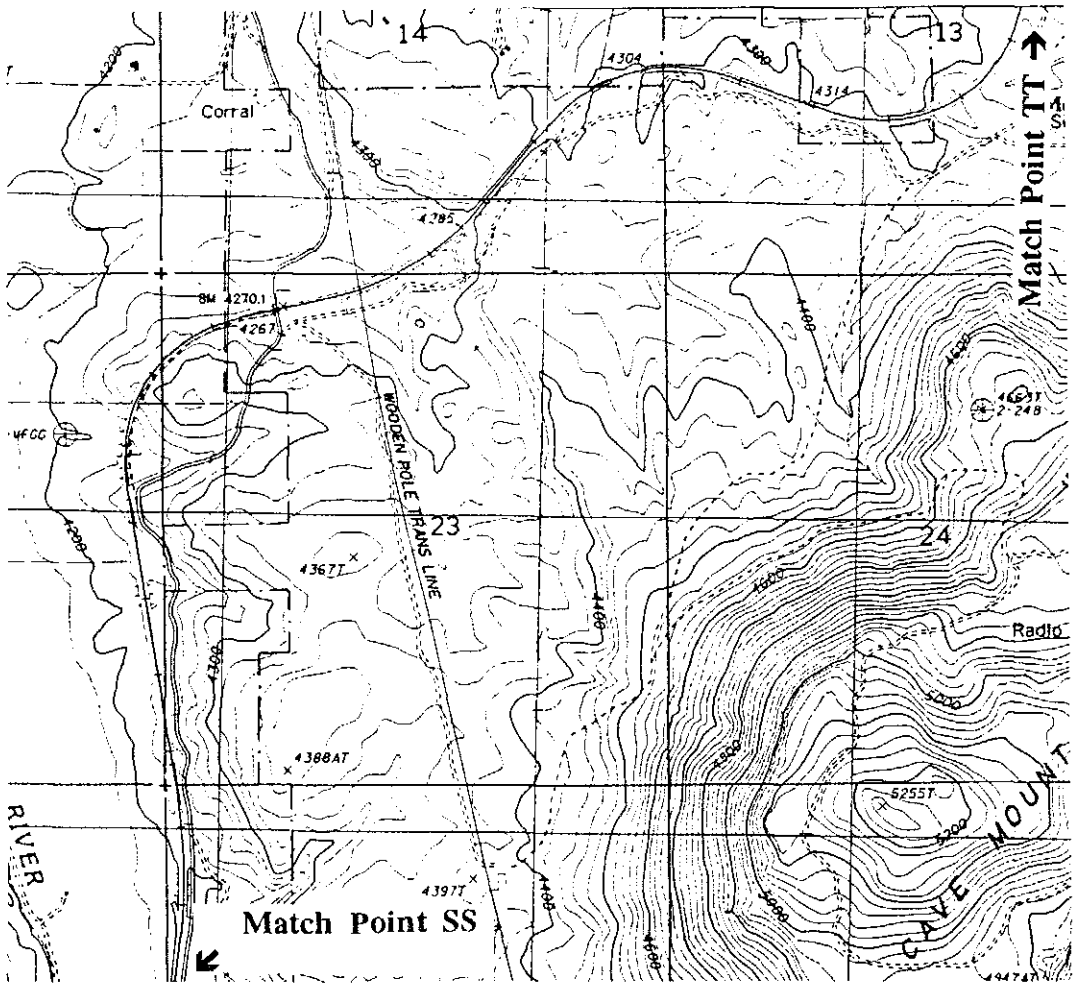

David Hill Cem
Match Point OO
Match Point NN
4162T
4170
4155T
4150
4164T
T 35 S
T 36 S
4143T
4147T
4159T
4169T
4172T
4149T
4186
4141T
4153
4146
SOUTHERN PACIFIC
Road on Levee
32
33
34
5
4

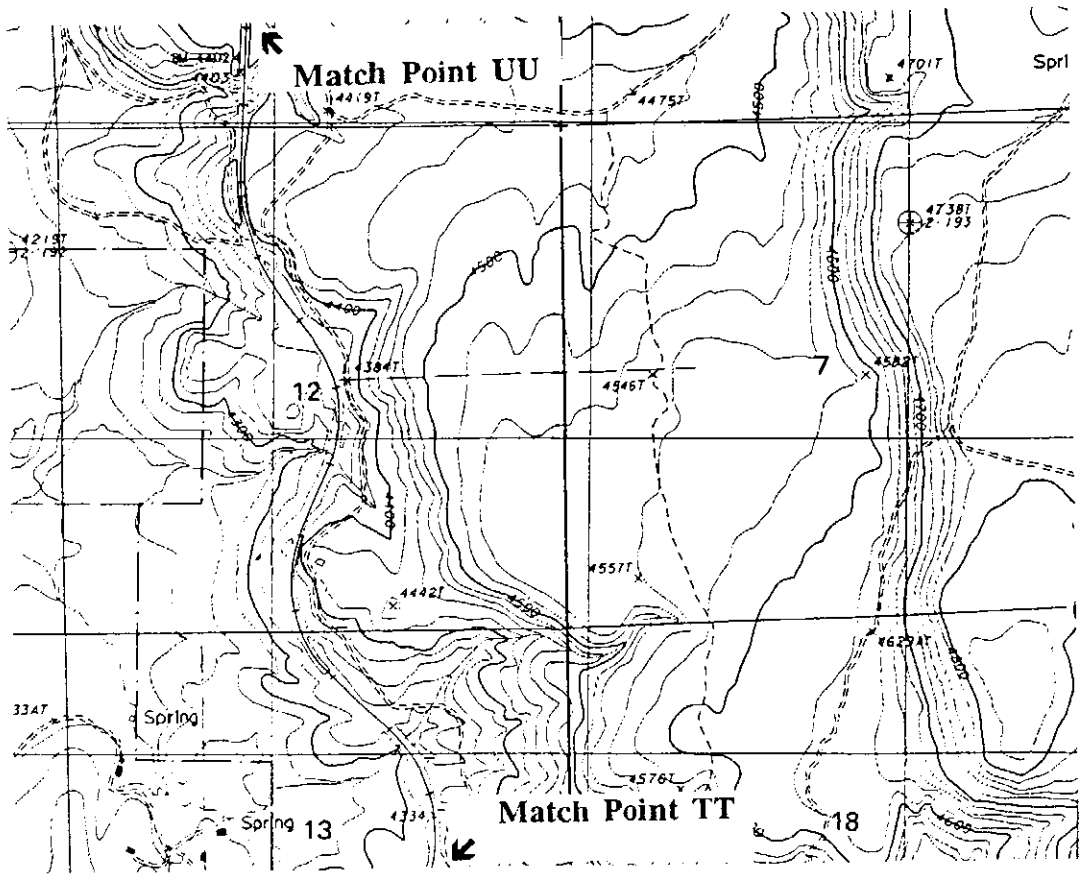

Match Point PP
Gravel Pit
17
16
4200
Wilson Cem
Gravel Pit
RIVER
4152
Williamson River Pumping Station
Viaduct
20
21
Gravel Pit
BM 4152
4162T
Lobert Siding
Double Wooden Pole Trans Line
MODOC POINT MAIN CANAL
4168
4176
28
29
Sand Pit
VFBM 1.22
Substation 4164
Match Point OO

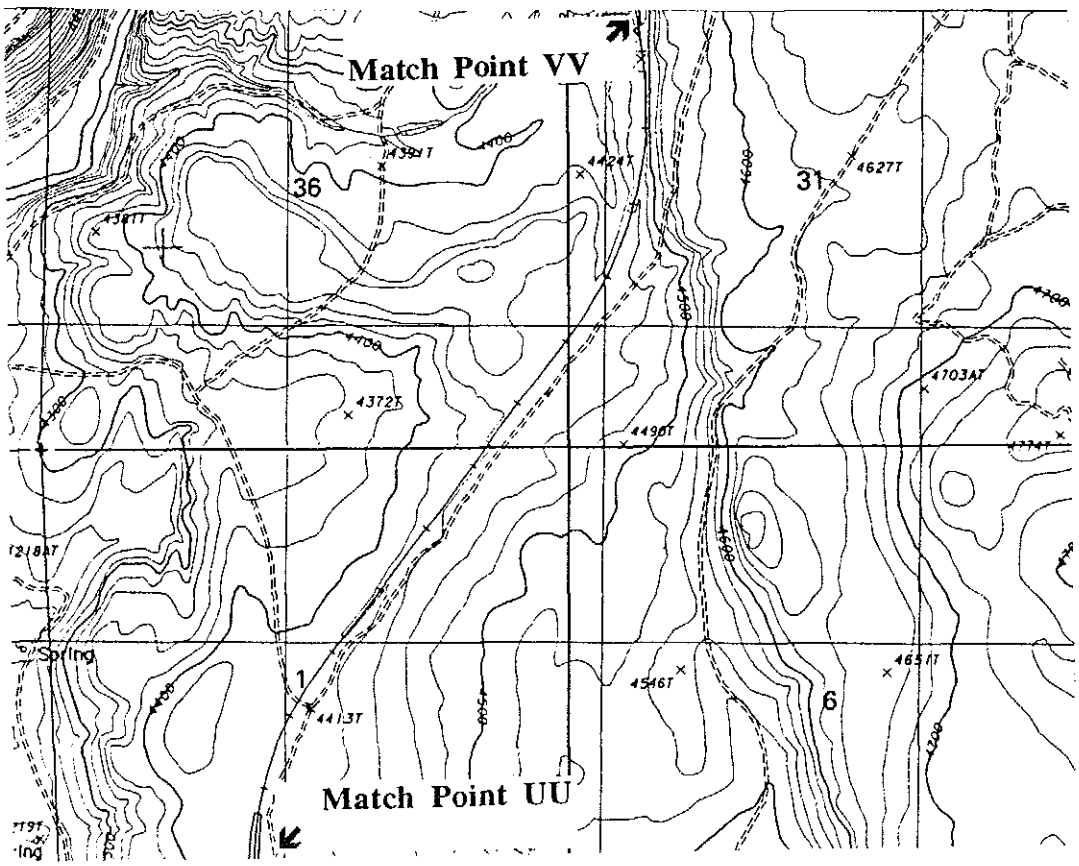

← Match Point QQ
← Match Point PP
WILLIAMSON R
MAIN
CANAL
POINT
POLE TRANS LINE
10
11
14
15
N
A
4638T
4524T
4309T
5041T
4860T
4770T
4752T
4805T
4484T

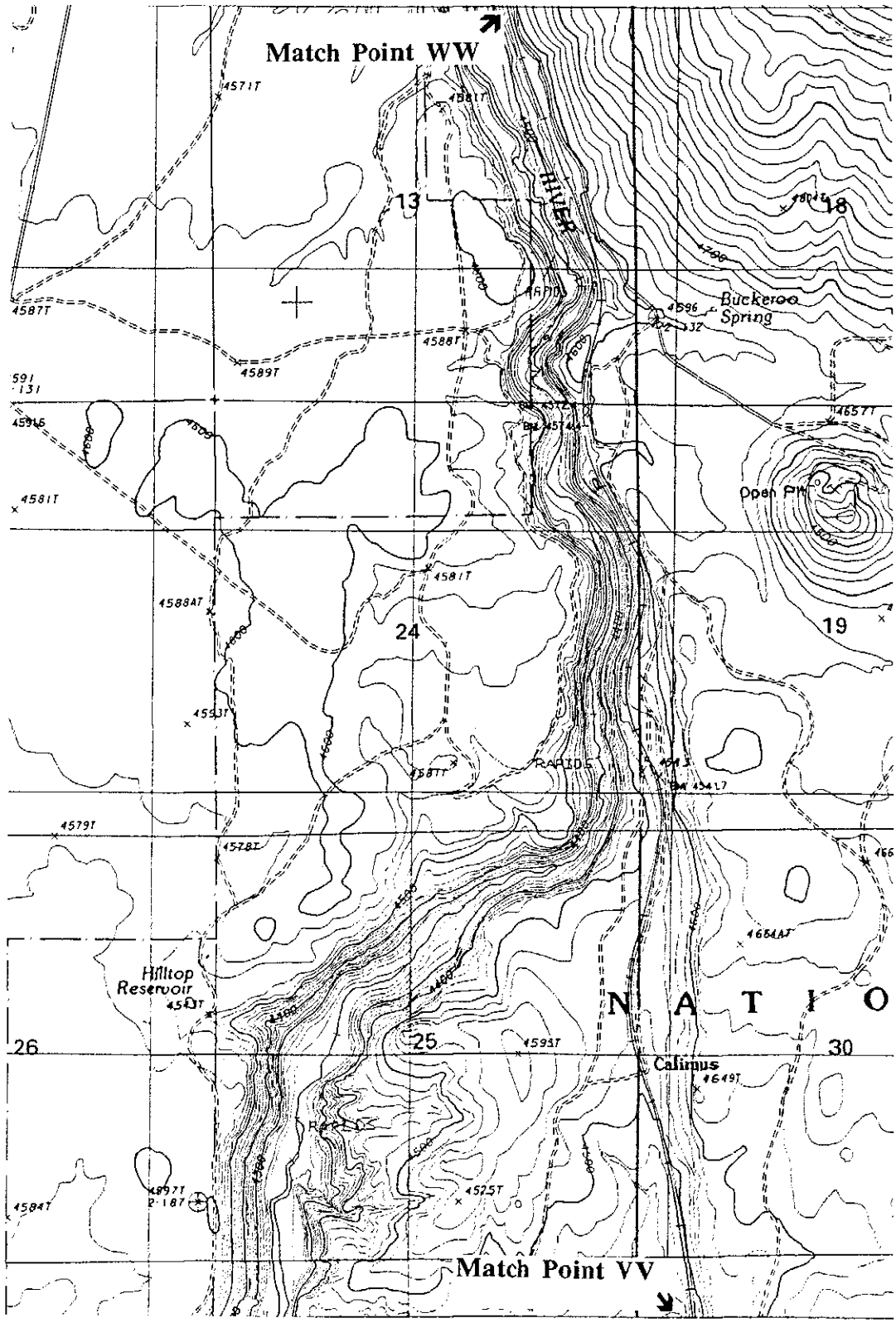

Heliports
BOUNDARY
Chiloquin Ranger Sta.
Chiloquin Airfield
4504T
NATIONAL
FOREST
T34S
T35S
4359T
Park
Match Point RR
WILLIAMSON RIVER
4230T
Match Point QQ
4300
4247T
VFBM
VFBM I-18
4206
4200
4194
Gravel Pit

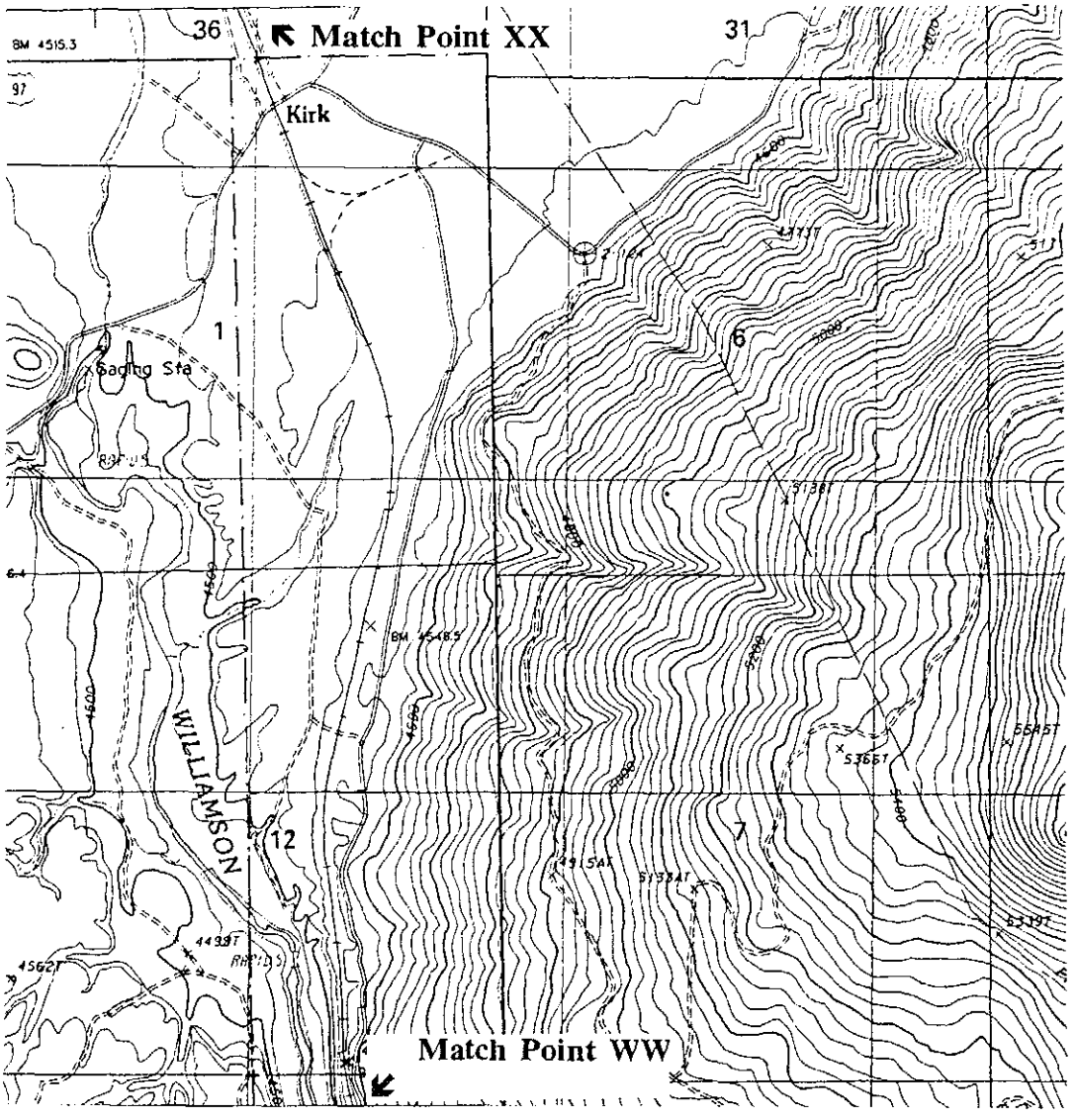

Match Point SS
Pine Ridge
27
Chiloquin
34
35
SPRAGUE
RIVER
Match Point RR
Rapids
Gaging Sta
Substa
WT
Cem

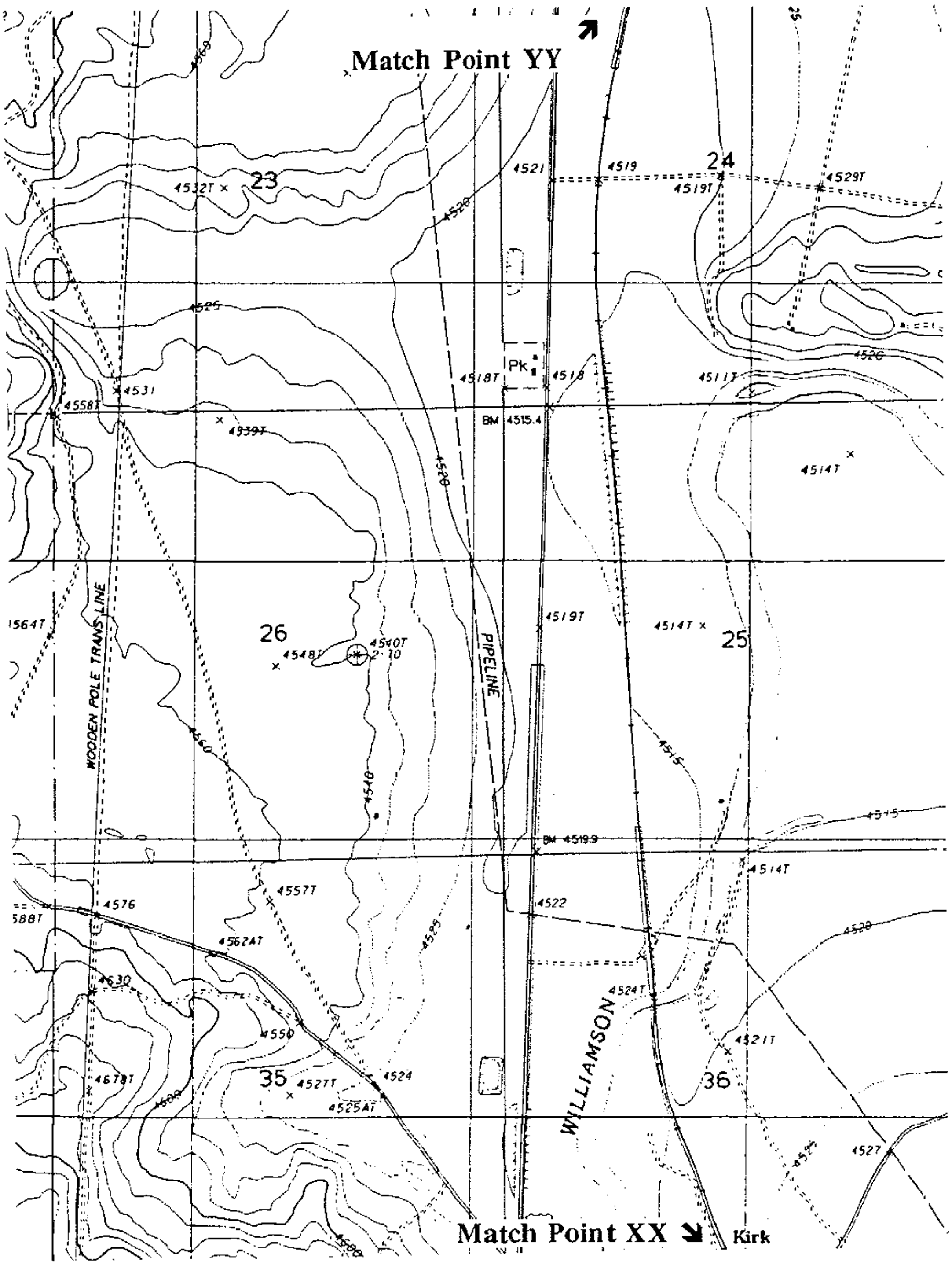

14
13
Corral
4304
4314
4295
Match Point TT
8M 4270.1
4267
WOODEN POLE TRANS LINE
23
24
4367T
Radio
4388AT
6255T
RIVER
4397T
Match Point SS

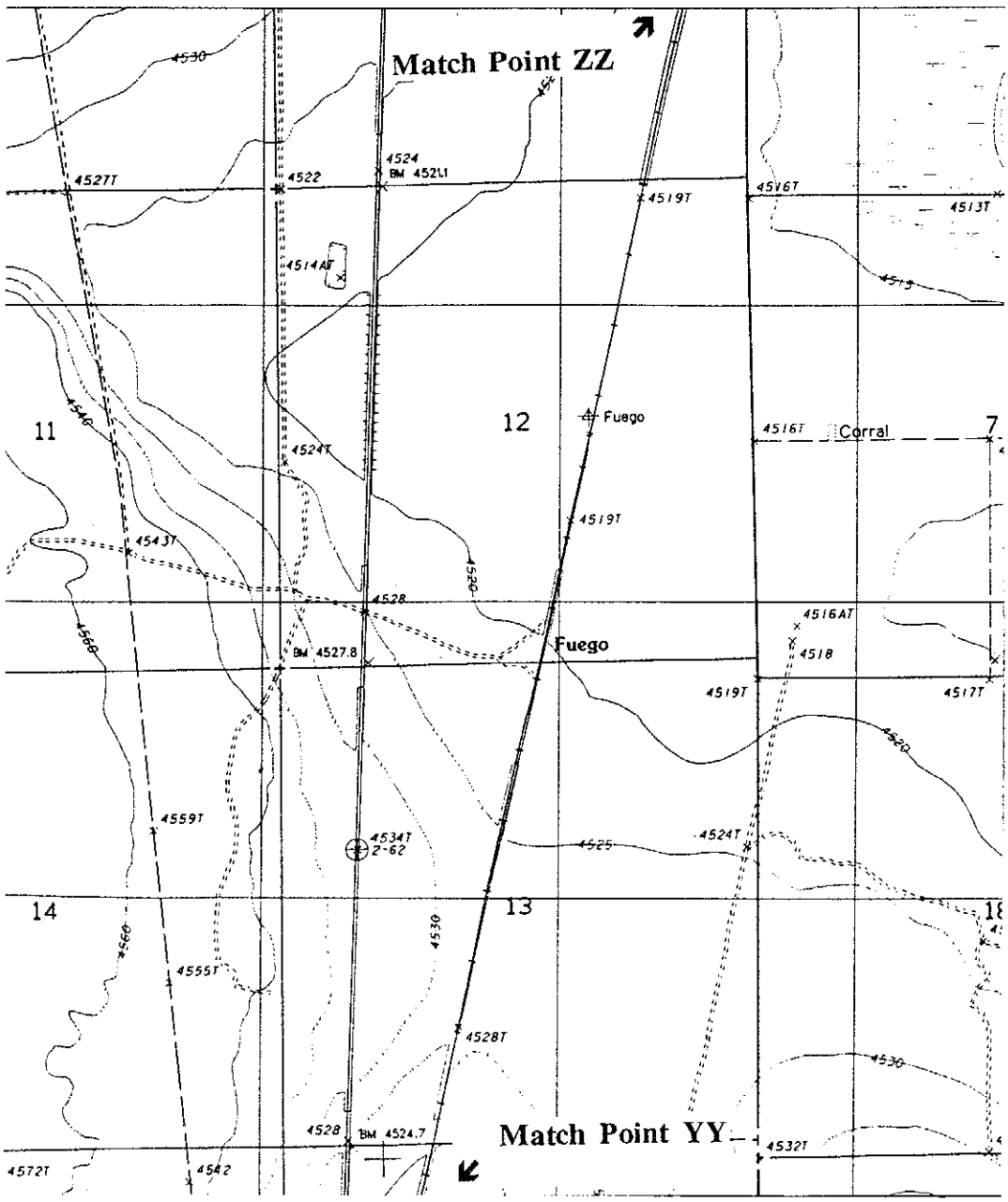

Match Point UU
Match Point TT
12
7
13
18
Spring
Spring
Spri

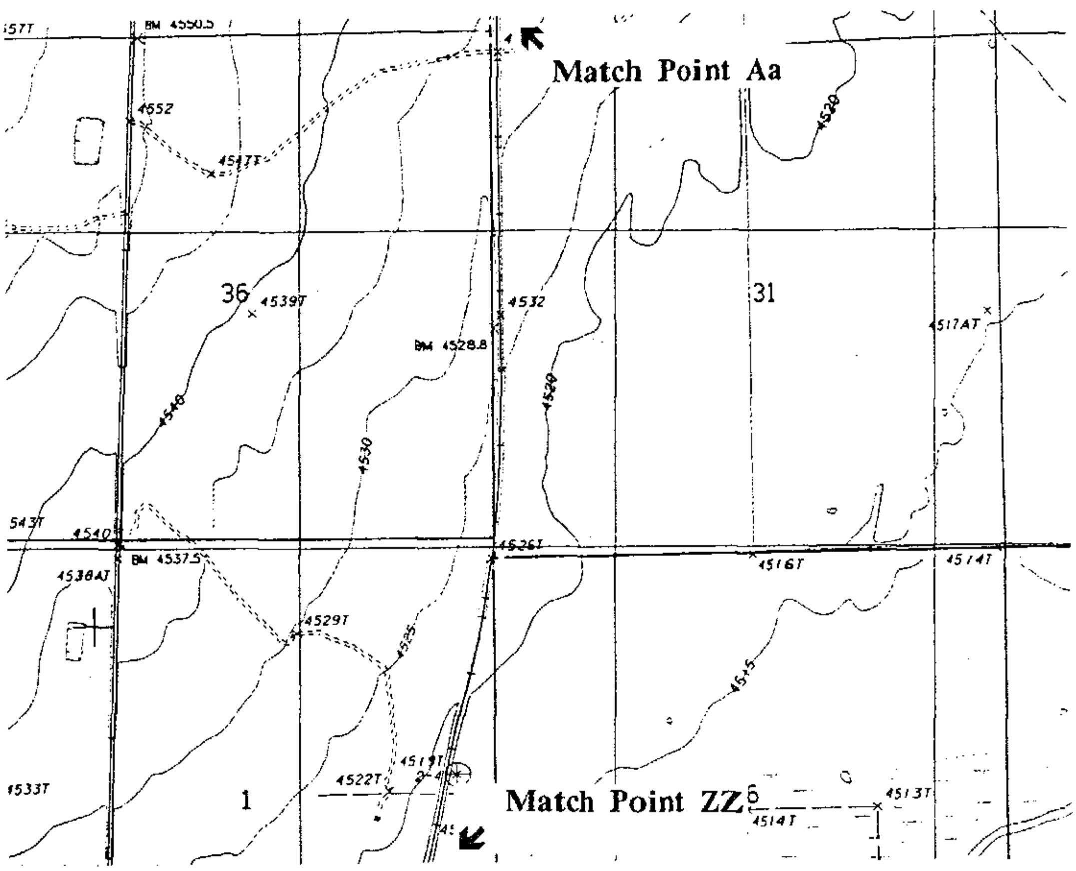

Match Point VV
36
31
1
6
Spring
Match Point UU

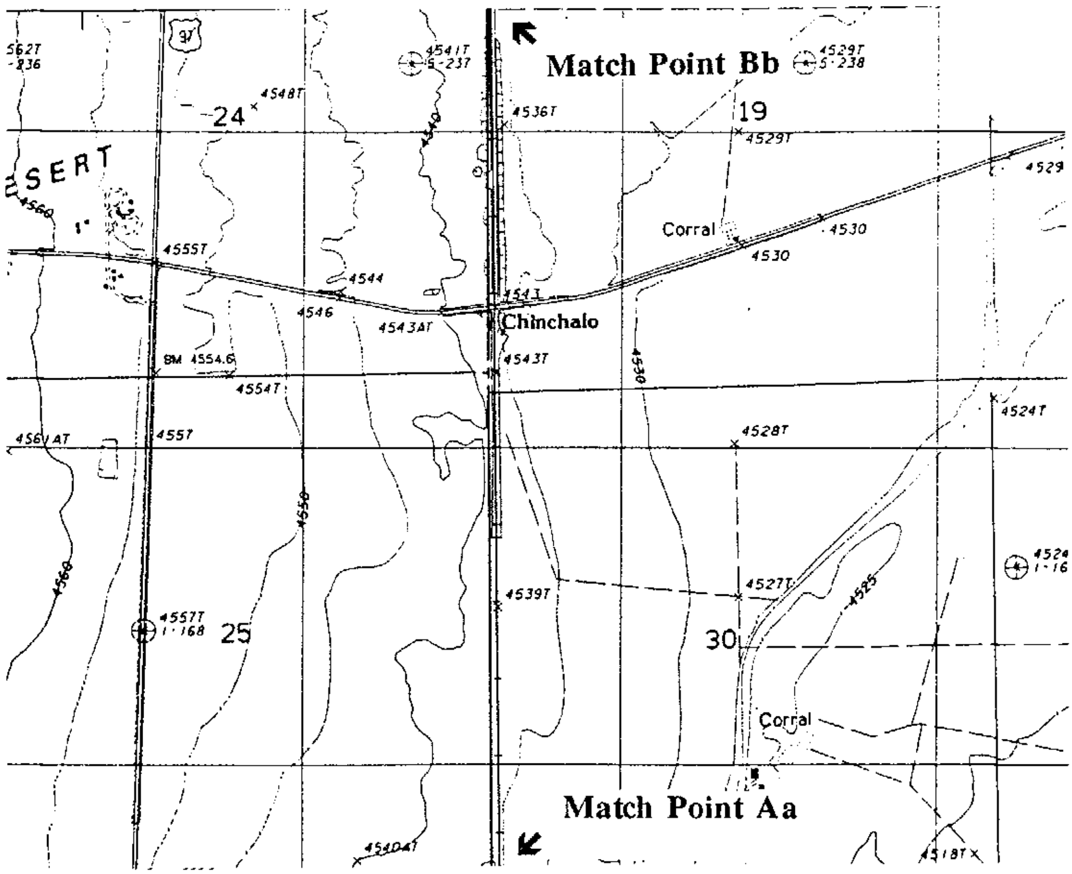

Match Point WW
RIVER
13
18
Buckeroo Spring
Open Pit
24
19
RAPIDS
Hilltop Reservoir
N A T I O
26
25
30
Calimus
Match Point VV

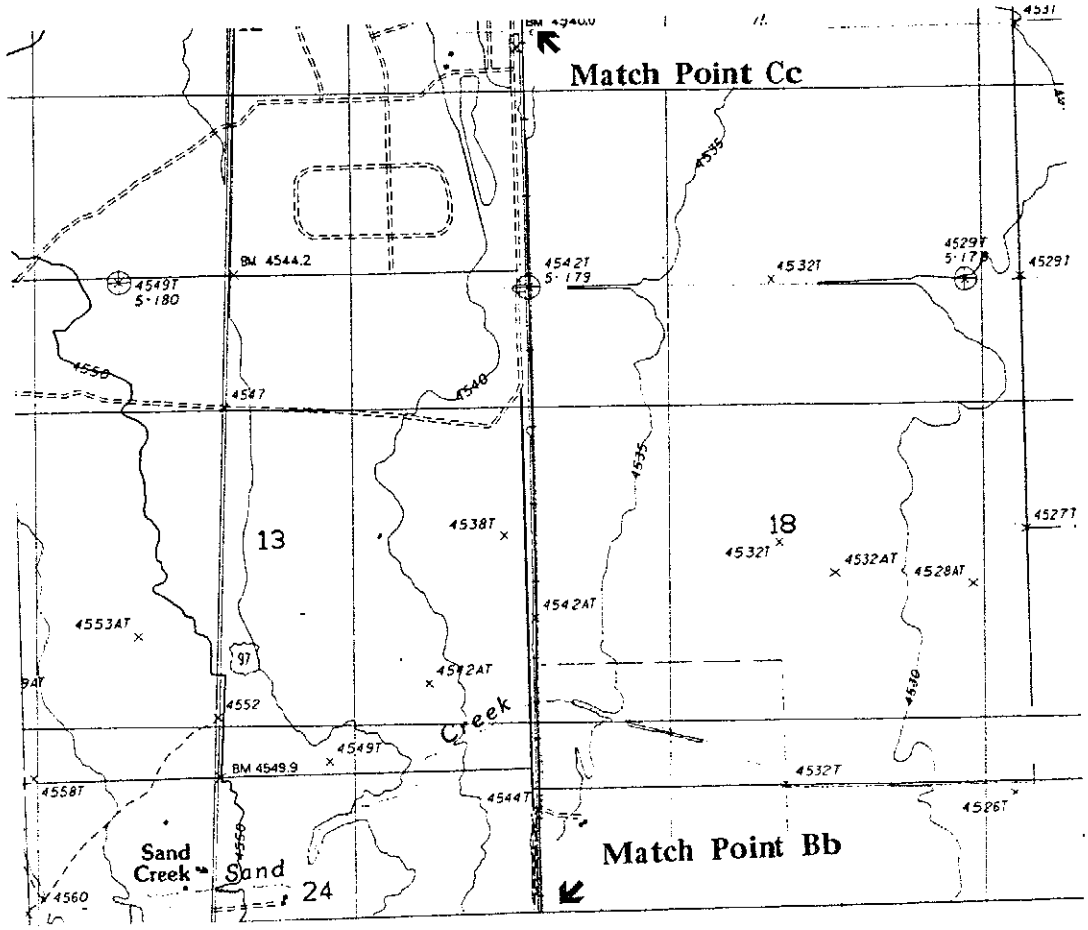

Match Point XX
Match Point WW
Kirk
Sading Sta
WILLIAMSON
36
31
1
6
12
7

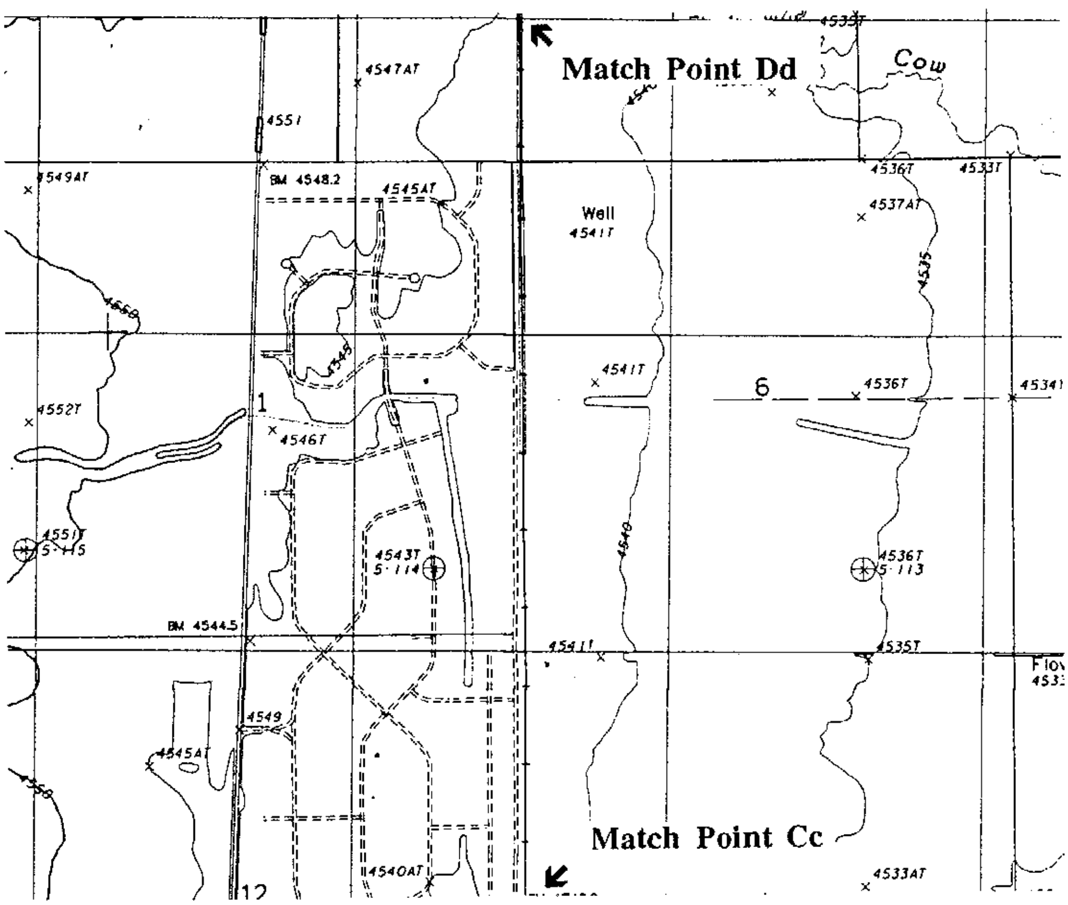

Match Point YY
23
24
4532T
4521
4519
4519T
4529T
4520
4525
Pk
4518T
4518
4511T
4531
4558T
4539T
BM 4515.4
4514T
4564T
WOODEN POLE TRANS. LINE
26
4548T
4540T
PIPELINE
4519T
4514T
25
4515
BM 4519.9
4514T
4576
4557T
4522
4562AT
4630
4550
WILLIAMSON
4524T
4521T
4678T
35
4527T
4524
4525AT
36
4527
Match Point XX
Kirk

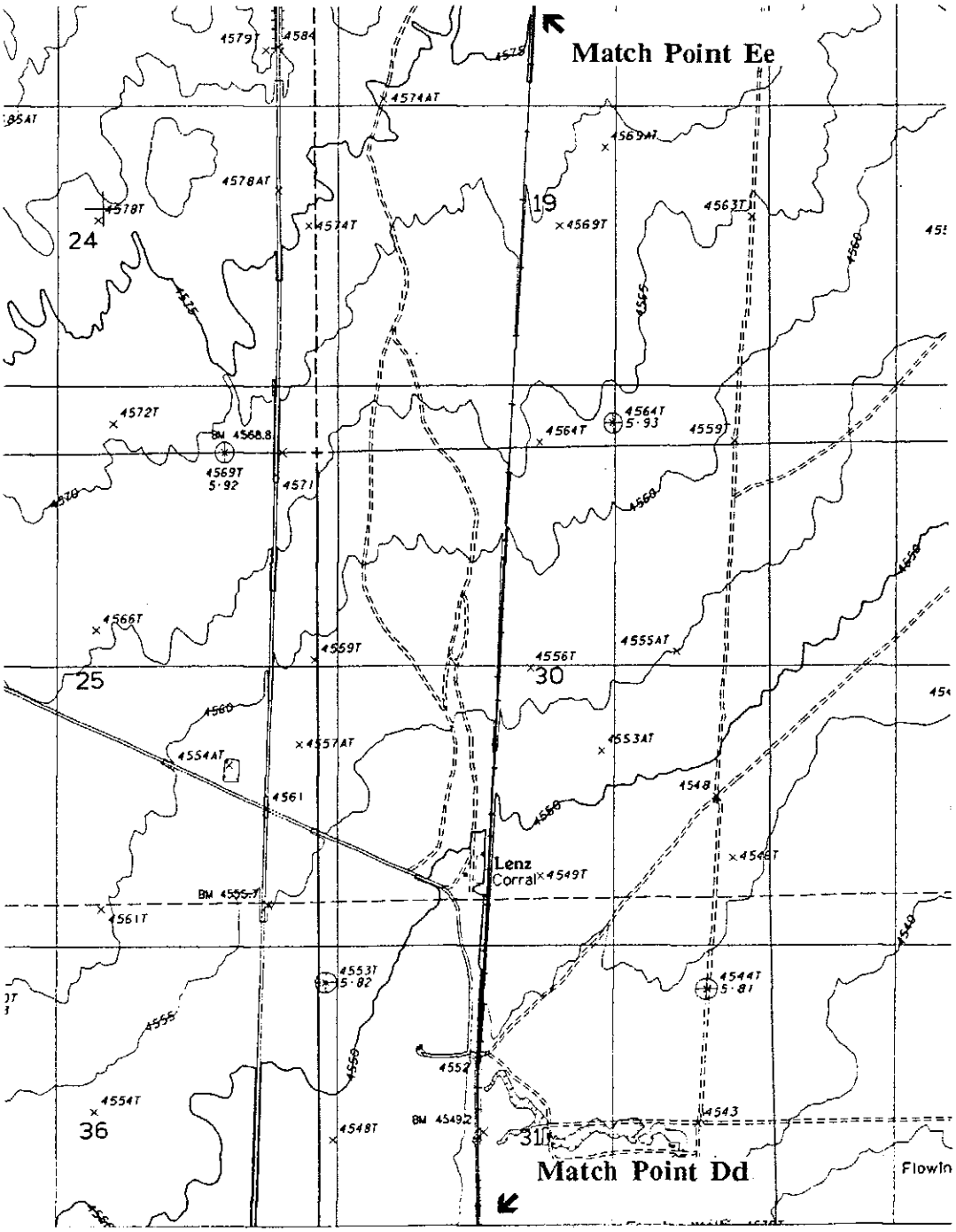

Match Point ZZ
4524
BM 4521
4527T
4522
4519T
4516T
4513T
4514AT
11
12
Fuego
Corral
7
4524T
4519T
4543T
4528
4516AT
4518
Fuego
BM 4527.8
4519T
4517T
4559T
4534T
2-62
4524T
14
13
4555T
4528T
4530
4528
BM 4524.7
Match Point YY
4532T
4572T
4562

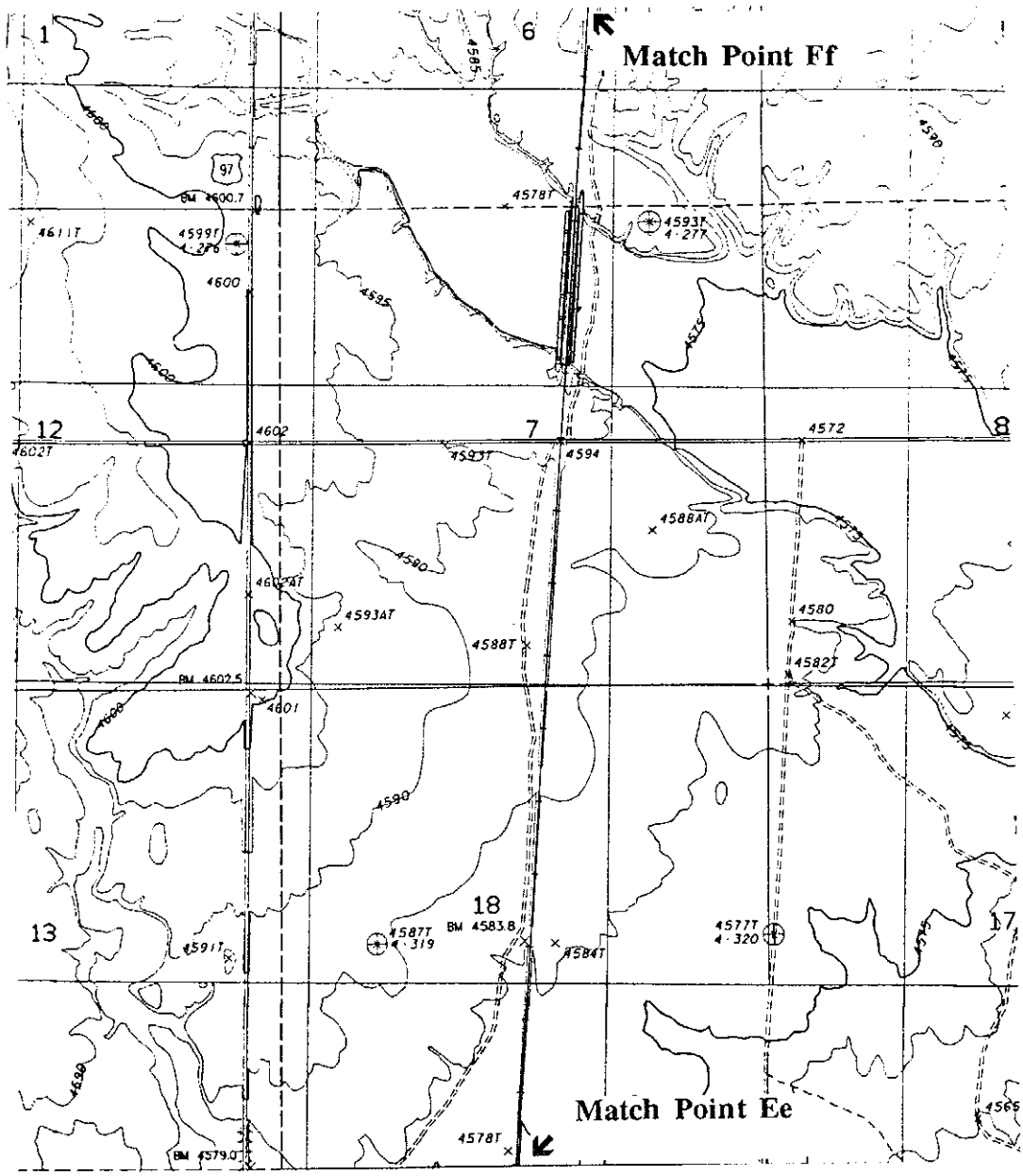

Match Point Aa
Match Point ZZ
36
31
1
BM 4528.8
BM 4537.5
4540
4530
4520
4525
4515
4539T
4532
4526T
4516T
4529T
4522T
4517AT
4513T
4514T
4533T
4538AT
4552

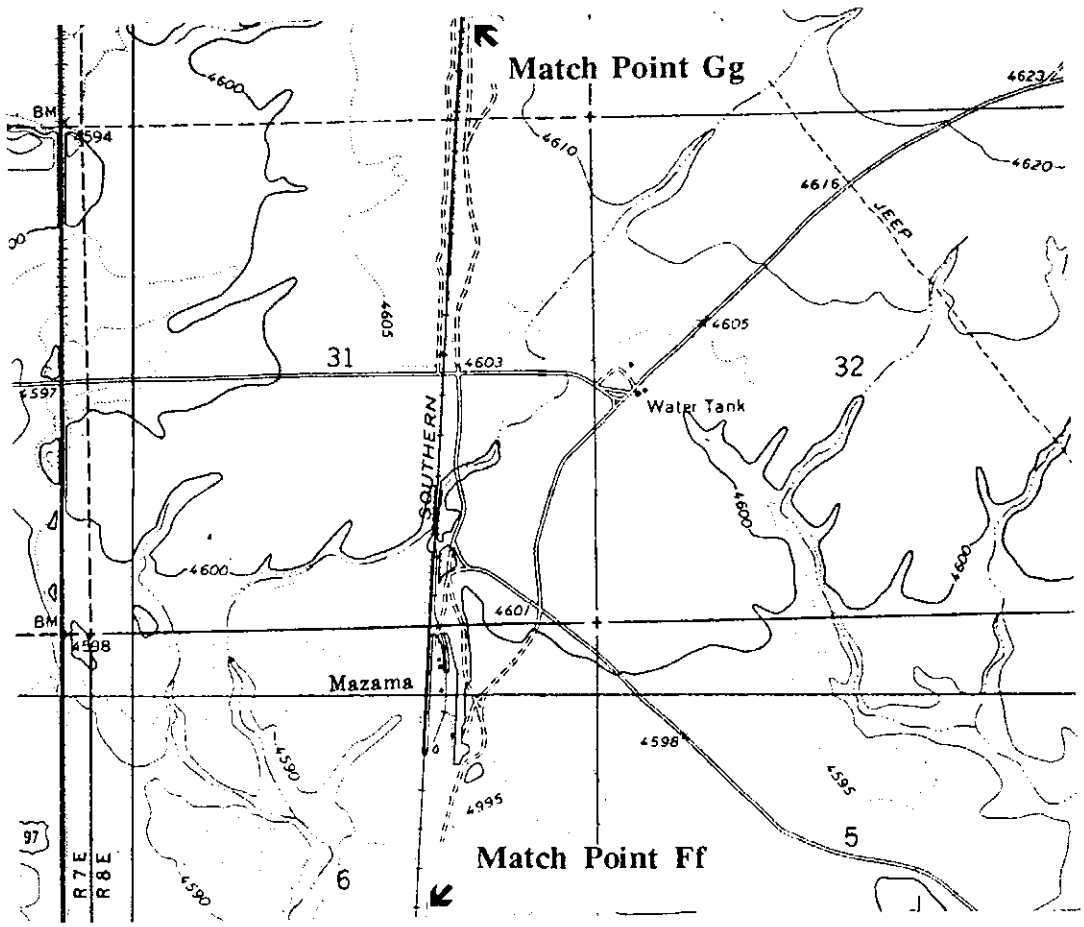

Match Point Bb
Chinchalo
Corral
Corral
Match Point Aa
24
19
25
30
BM 4554.6

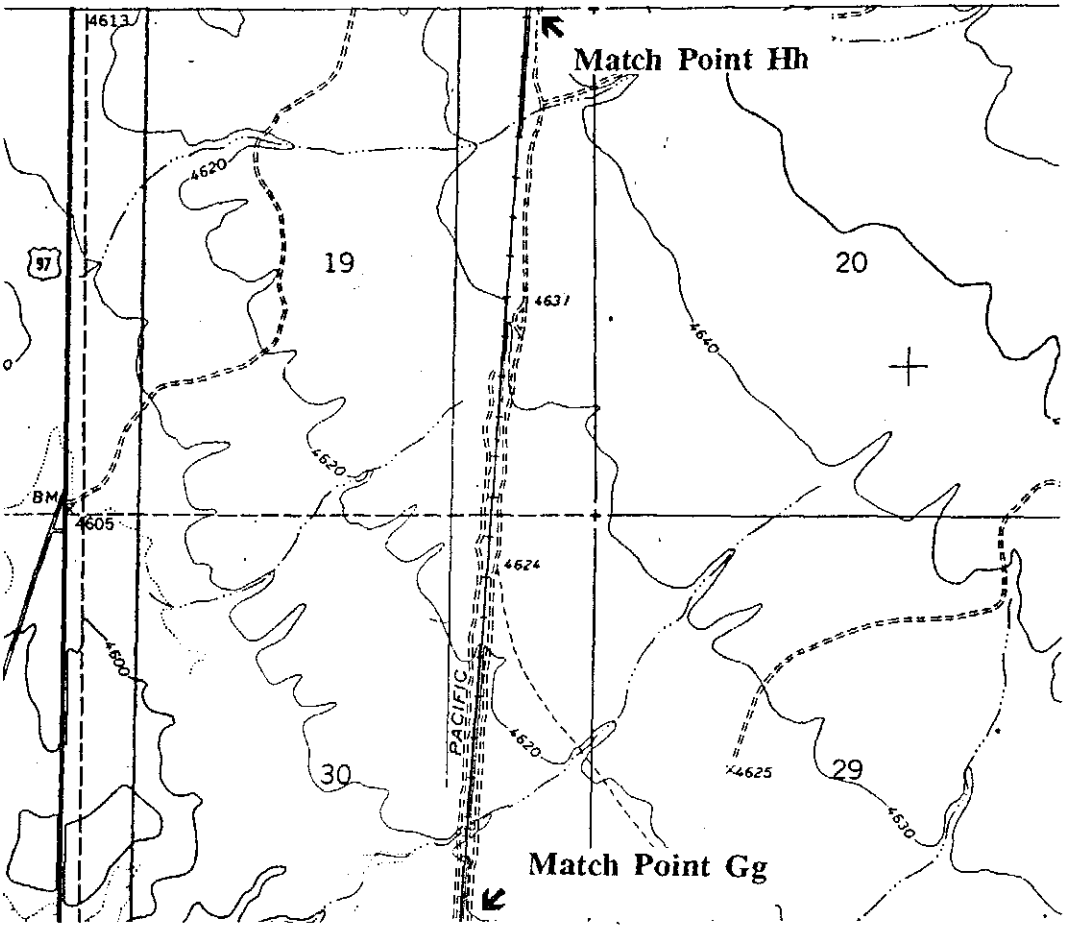

Match Point Cc
BM 4544.2
4549T
5-180
4542T
5-179
4532T
4529T
5-178
4529T
4550
4547
4540
4535
13
4538T
18
4532T
4532AT
4528AT
4527T
4553AT
4542AT
97
4552
4542AT
Creek
4549T
BM 4549.9
4532T
4558T
4544T
4526T
Sand
Creek
Sand
24
4560
Match Point Bb

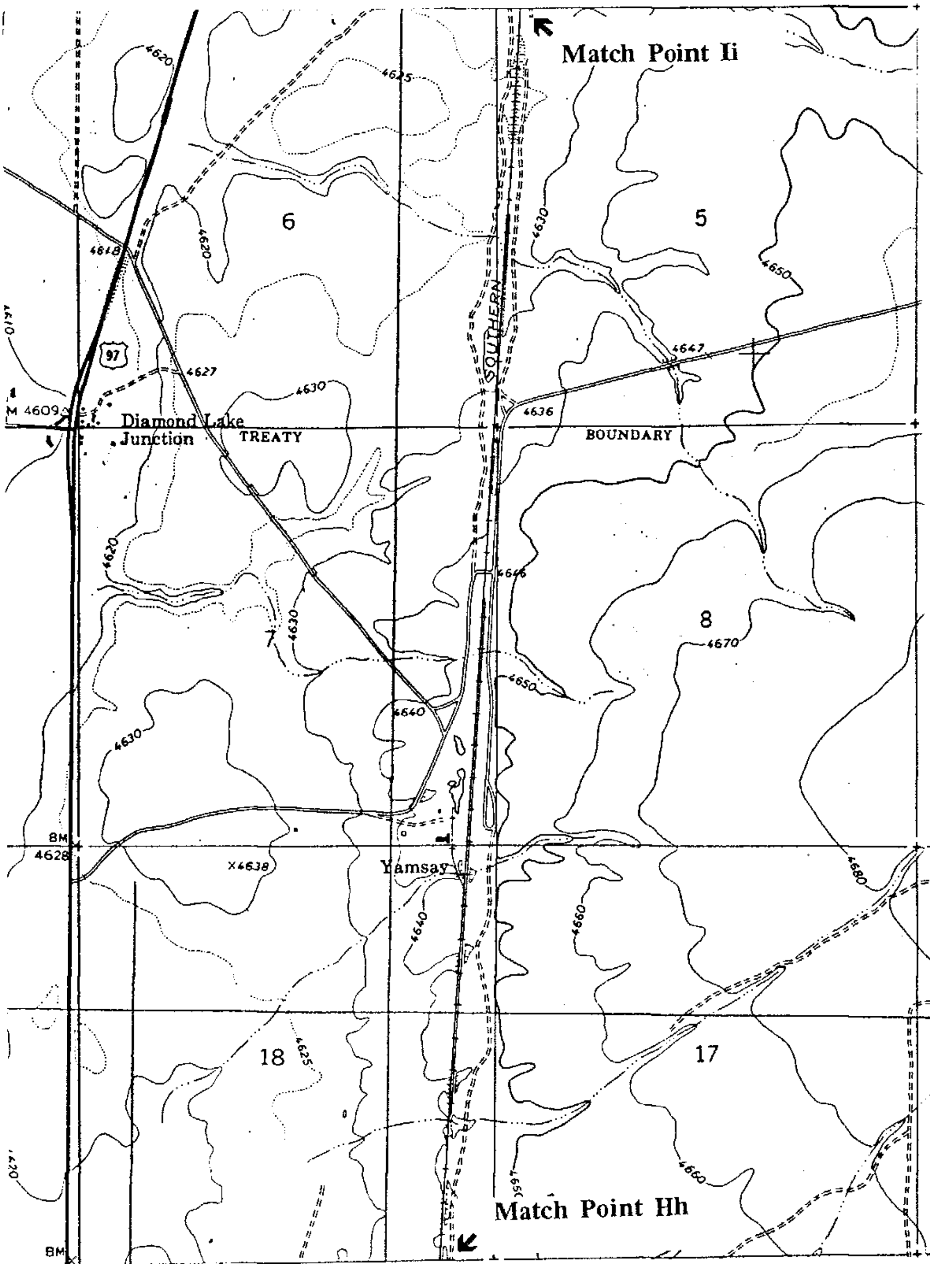

Match Point Dd
Cow
4547AT
4551
4549AT
BM 4548.2
4545AT
Well
4541T
4536T
4533T
4537AT
4535
4541T
6
4536T
1
4552T
4546T
4543T
5-114
4536T
5-113
BM 4544.5
4541T
4535T
4549
4545AT
4540AT
Match Point Cc
4533AT
12

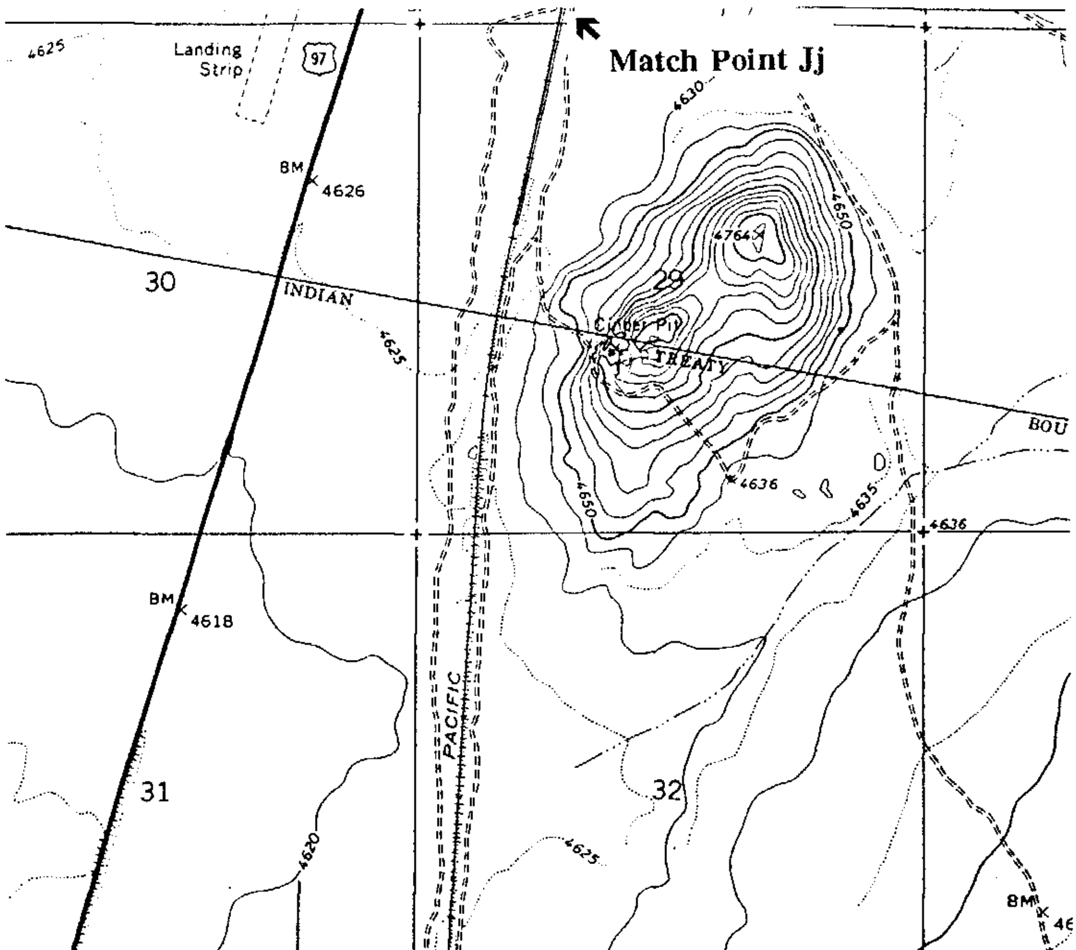

Match Point Ee
Match Point Dd
Lenz
Corral
24
19
25
30
36
31
BM 4568.8
BM 4555.7
BM 4549.2
4564T
5·93
4569T
5·92
4553T
5·82
4544T
5·81
4574AT
4578AT
4578T
4574T
4569AT
4563T
4572T
4564T
4559T
4571
4566T
4559T
4556T
4555AT
4557AT
4553AT
4554AT
4561
4548
4549T
4561T
4554T
4548T
4552
4543
Flowin

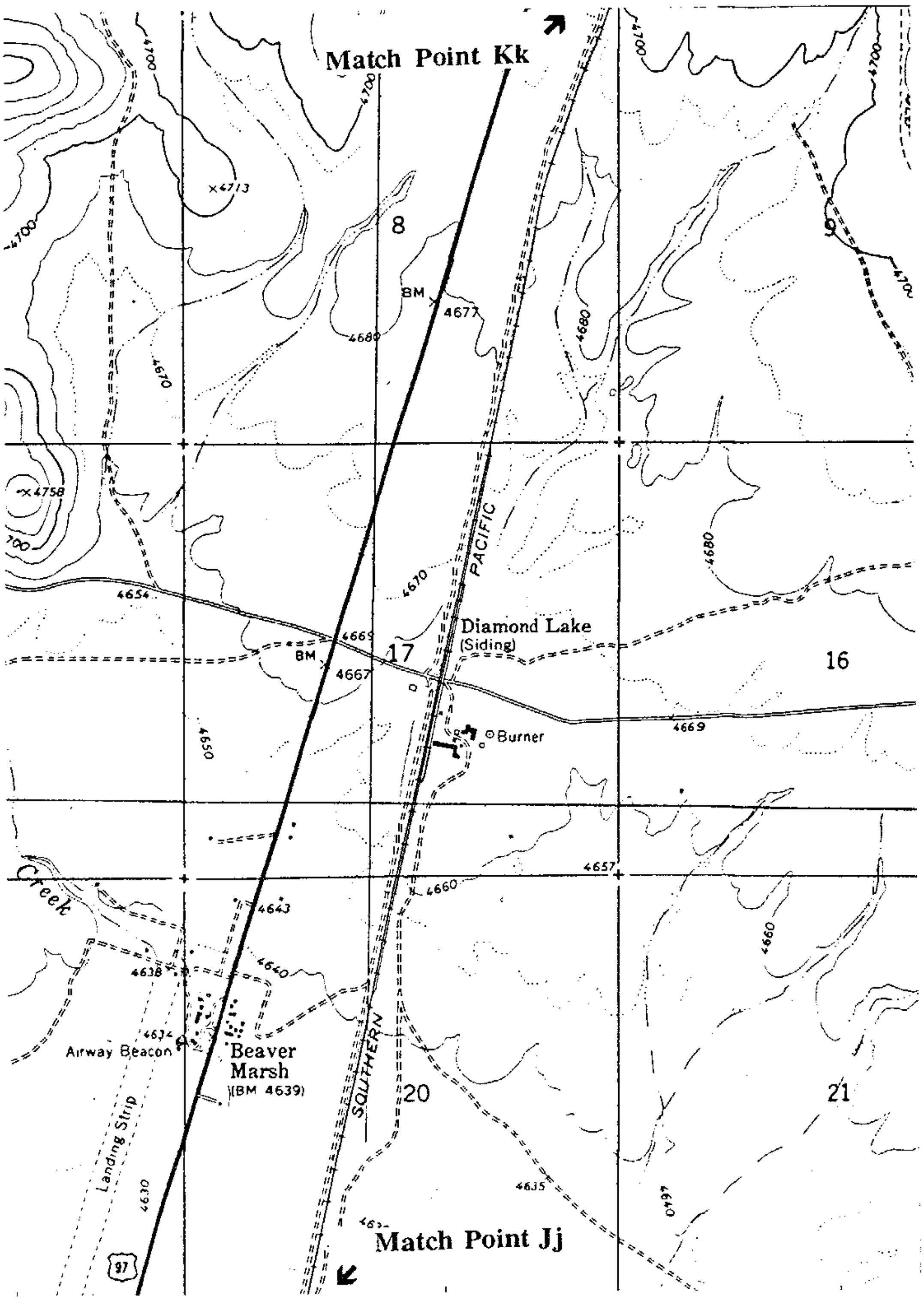

Match Point Ff
Match Point Ee
1
6
7
8
12
13
17
18
97
BM 4600.7
BM 4602.5
BM 4583.8
BM 4579.0
4578T
4593T
4611T
4599T
4600
4602
4572
4594
4588AT
4580
4593AT
4588T
4582T
4601
4590
4587T
4591T
4584T
4577T
4565

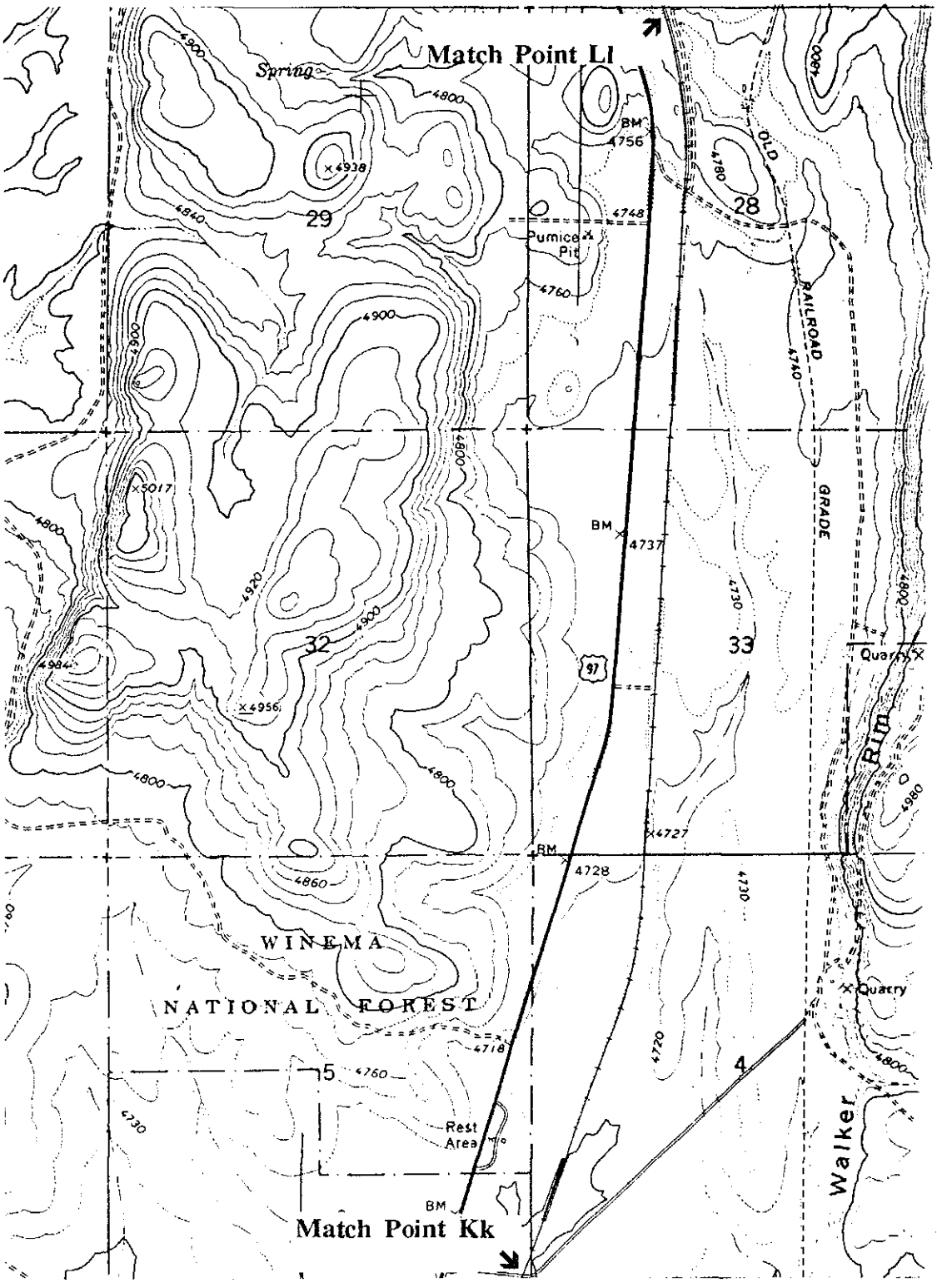

Match Point Gg
Match Point Ff
BM
4594
4600
4610
4616
4623½
4620
JEEP
4605
31
4603
32
4597
Water Tank
SOUTHERN
4600
4601
BM
4598
Mazama
4590
4595
97
R7E
R8E
6
5

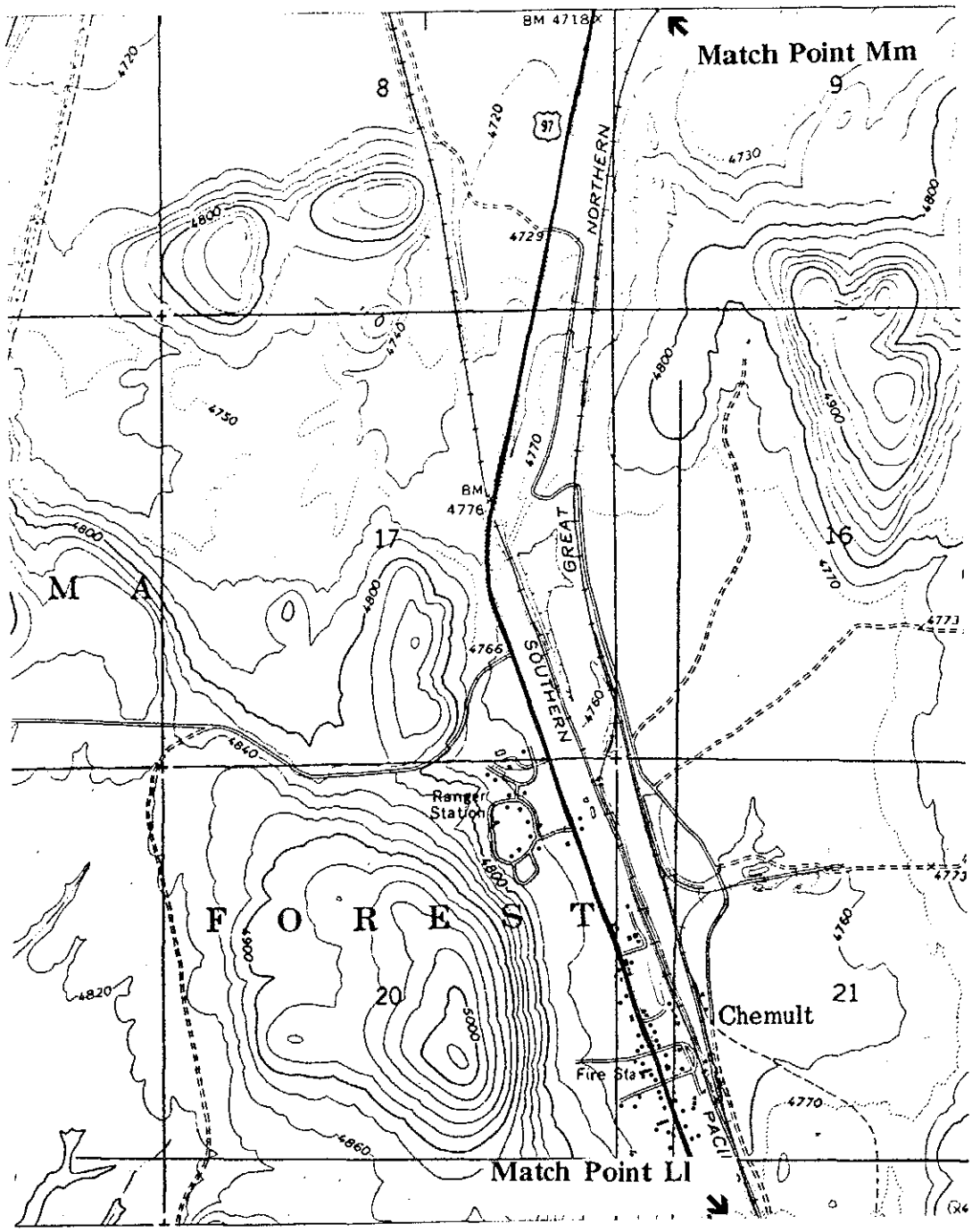

Match Point Hh
Match Point Gg
4613
4620
97
19
20
4631
4640
4620
BM
4605
4624
4600
PACIFIC
4620
30
4625
29
4630

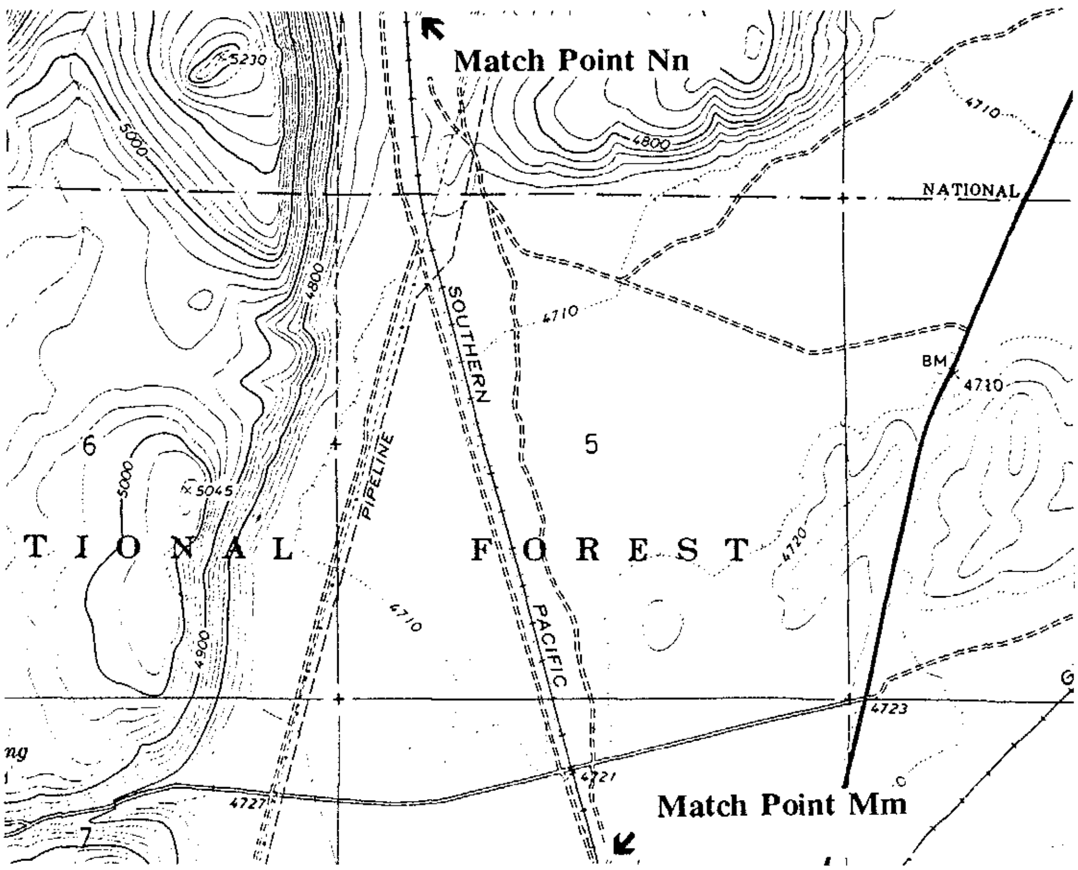

Match Point Ii
6
5
4620
4625
4618
4630
4650
4647
97
4627
4636
4609
Diamond Lake
Junction
TREATY
BOUNDARY
SOUTHERN
4646
8
4670
7
4650
4640
BM
4628
X4638
Yamsay
4680
4660
18
17
4625
Match Point Hh
BM

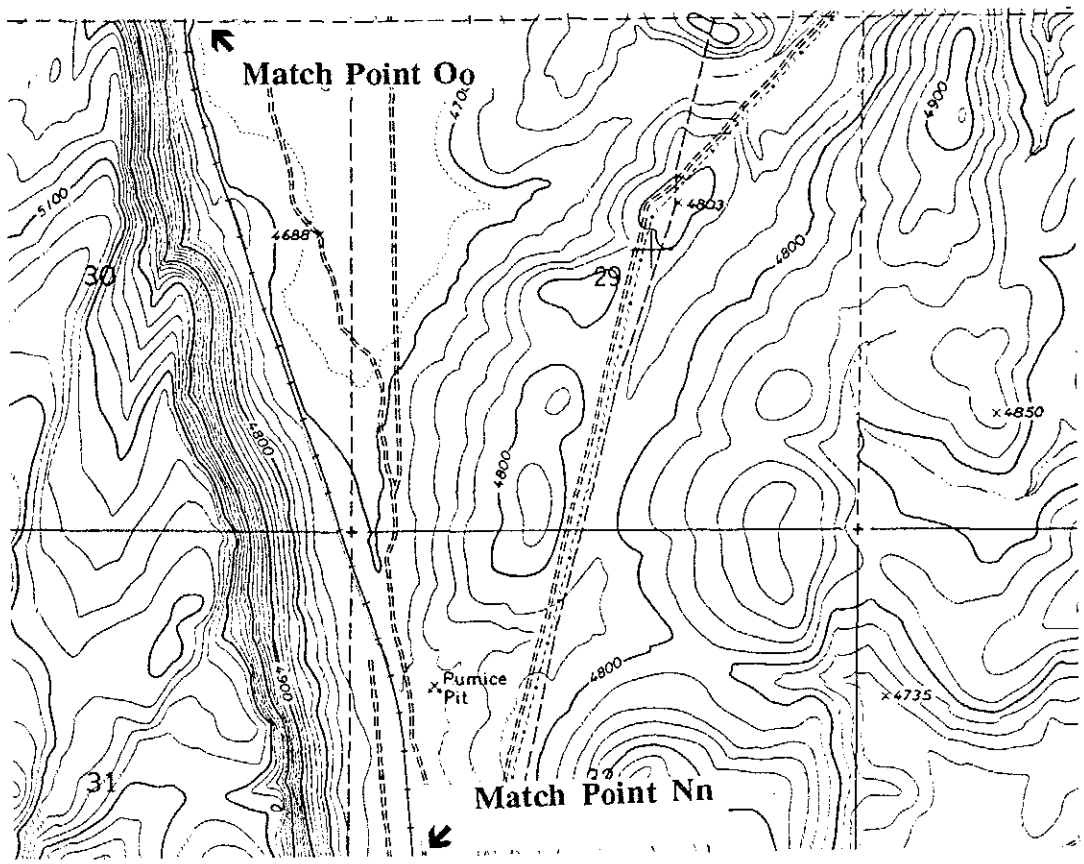

Match Point Jj
Match Point Ii
Landing Strip
97
BM 4626
BM 4618
BM 4617
30
31
29
32
INDIAN
TREATY
BOU
Cinder Pit
PACIFIC
4625
4630
4650
4764
4636
4635
4620

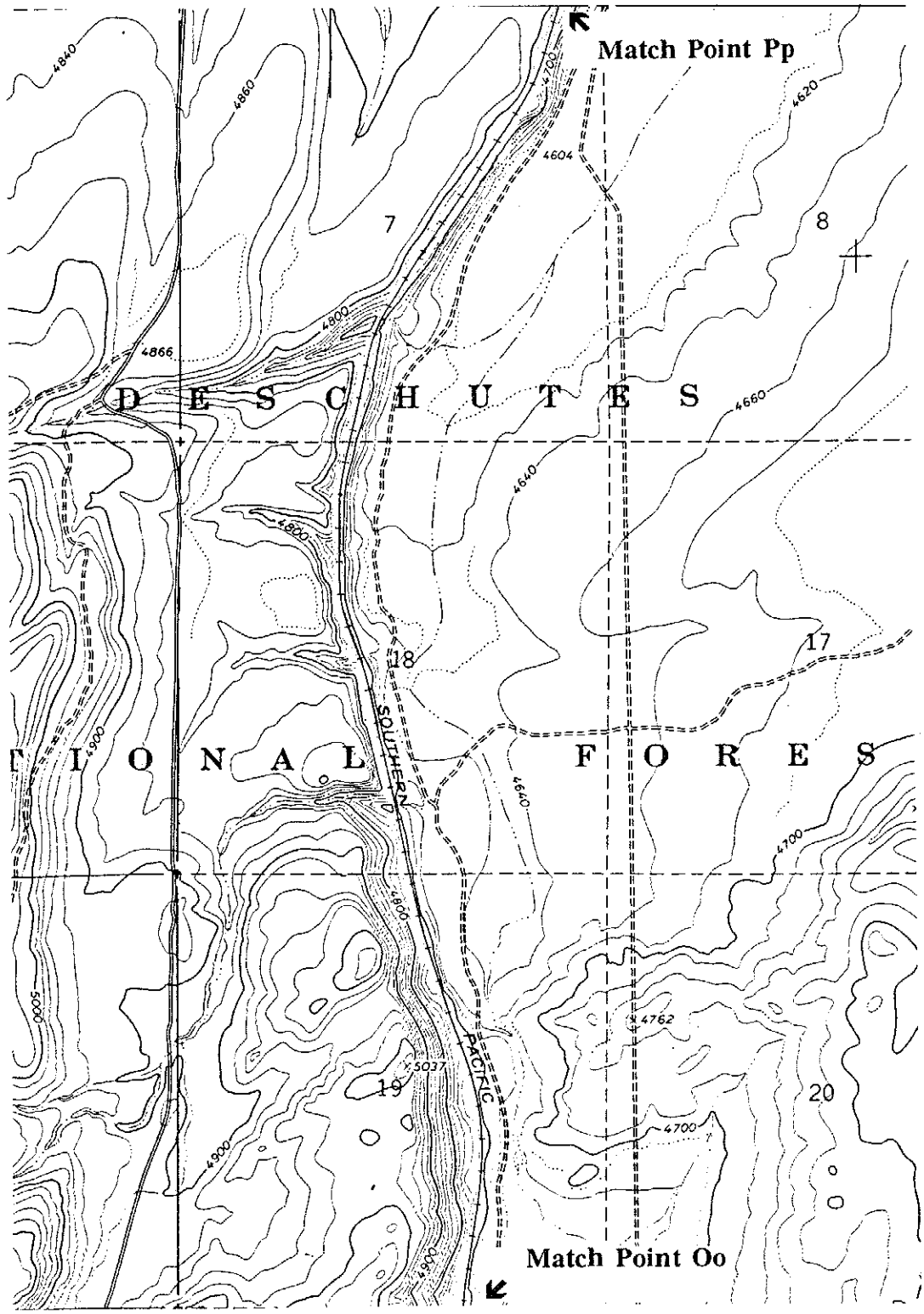

Match Point Kk
8
9
BM
4677
4680
4670
4700
×4713
×4758
4654
4669
BM
4667
17
PACIFIC
Diamond Lake
(Siding)
16
Burner
4669
4650
4657
4660
4643
4640
4638
Creek
Airway Beacon
Beaver
Marsh
(BM 4639)
SOUTHERN
20
21
Landing Strip
4630
4635
4640
97
Match Point Jj

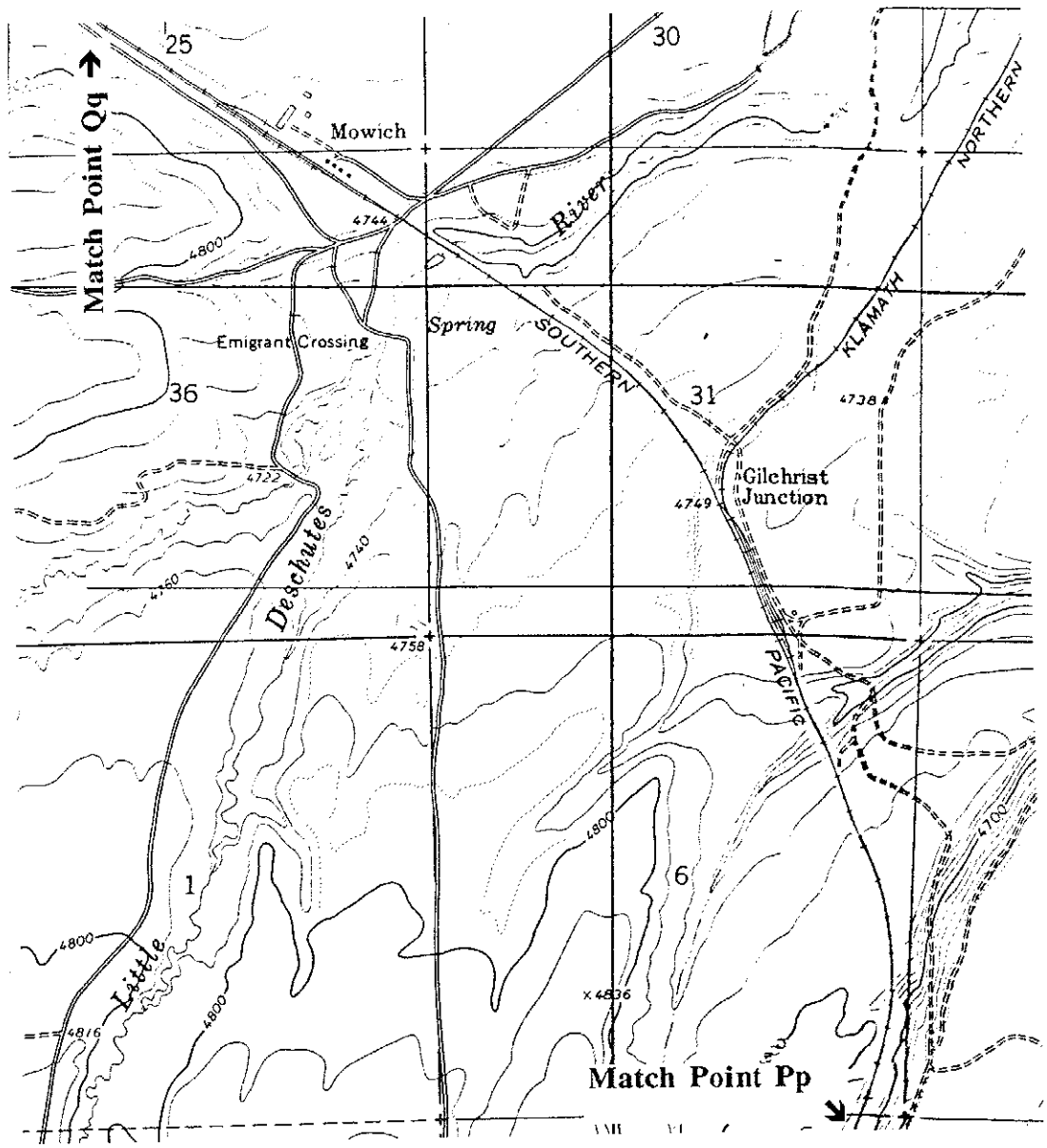

Match Point Ll
Spring
BM
4756
OLD
RAILROAD
GRADE
Pumice Pit
29
28
32
33
BM
4737
Quarry
Rim
BM
4728
WINEMA
NATIONAL FOREST
Quarry
5
4
Rest Area
BM
Match Point Kk
Walker

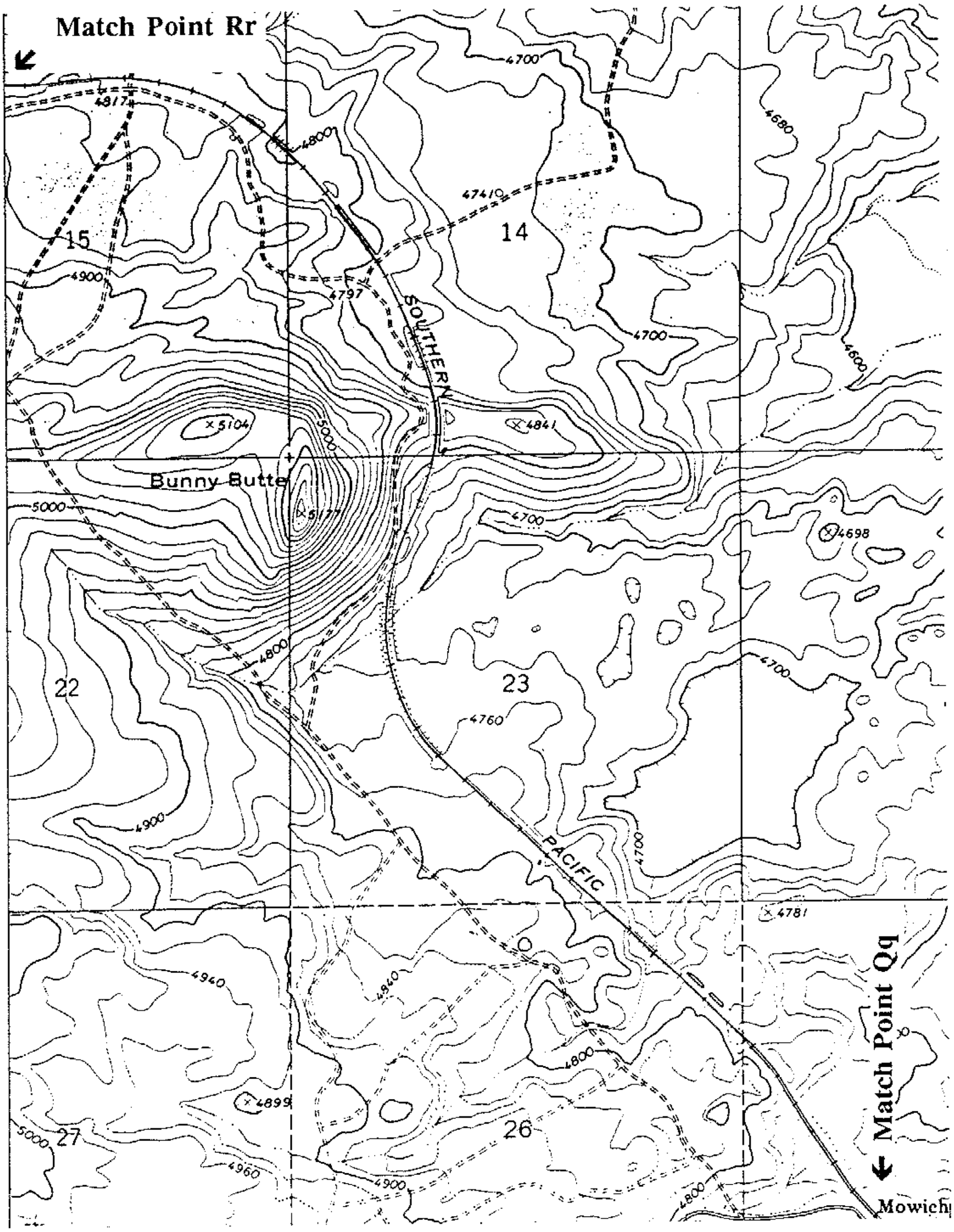

Match Point Mm
Match Point Ll
Chemult
Ranger Station
Fire Sta
NORTHERN
GREAT
SOUTHERN
PACIFIC
M A
F O R E S T
BM 4718
BM 4776
8
9
16
17
20
21
97

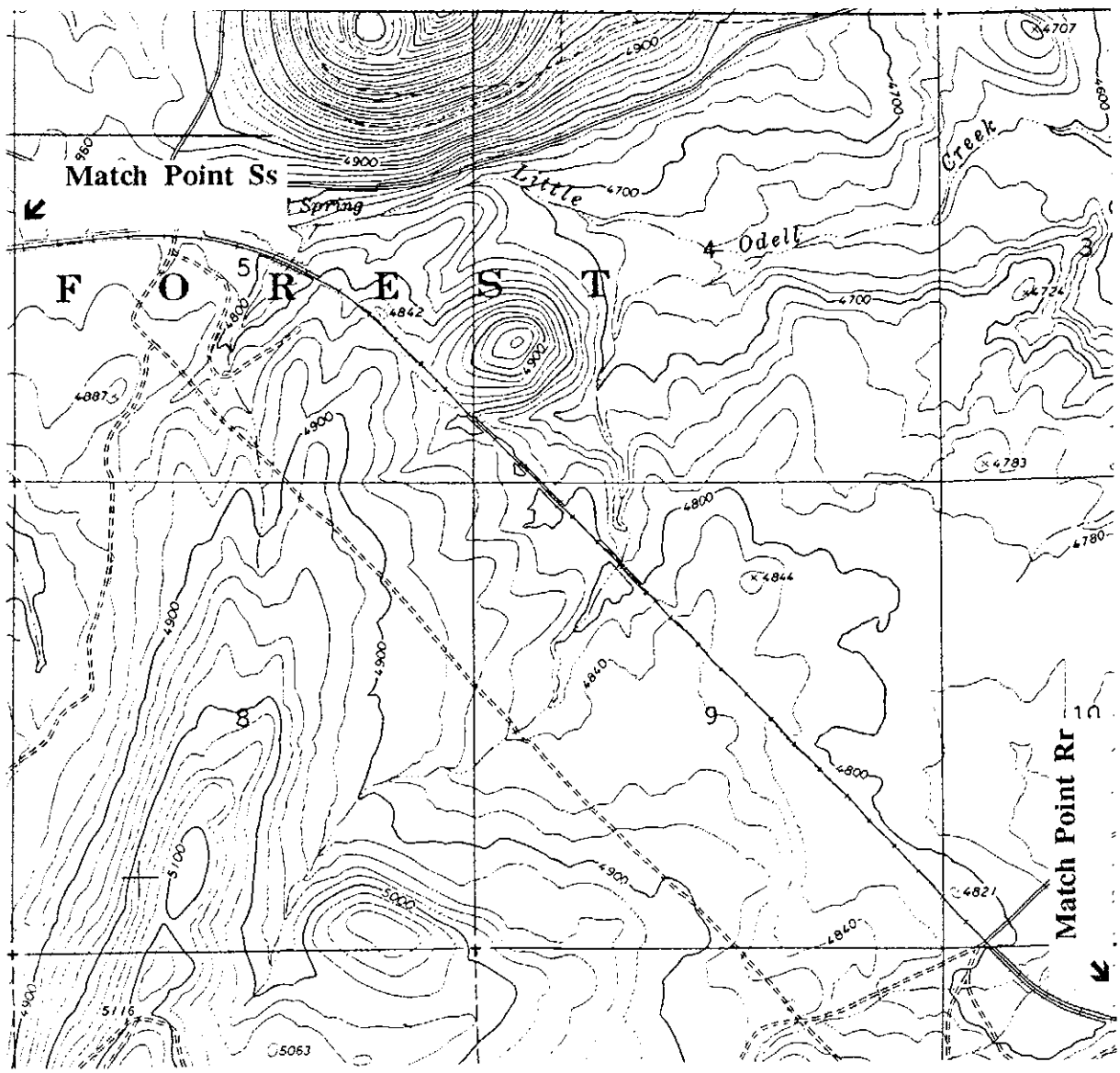

Match Point Nn
5230
5000
4800
4710
NATIONAL
4800
SOUTHERN
4710
BM
4710
6
5
5000
5045
PIPELINE
T I O N A L F O R E S T
4720
4710
4900
PACIFIC
4723
4721
4727
7
Match Point Mm

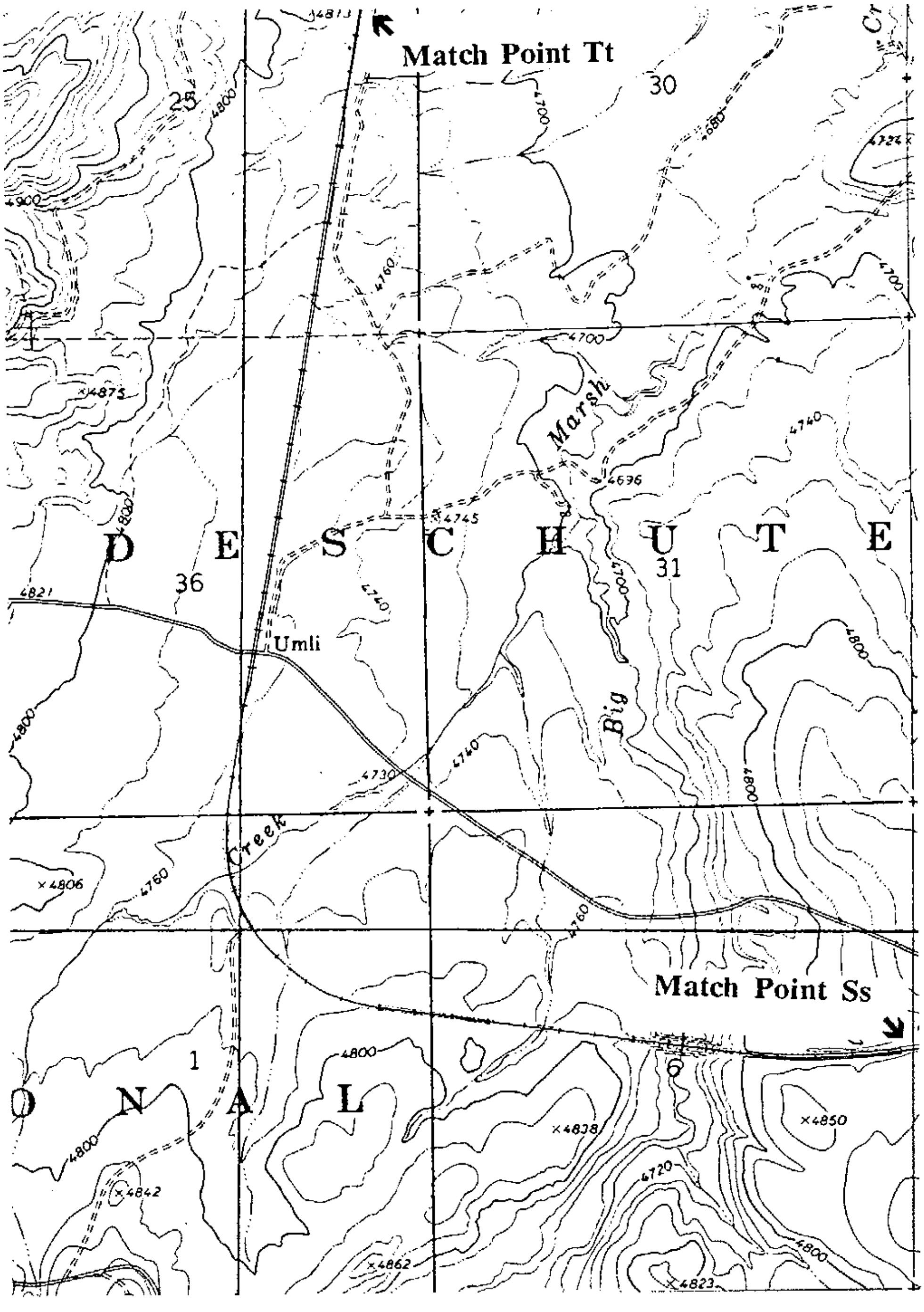

Match Point Oo
5100
4700
4900
4803
4688
4800
30
29
4800
4800
4850
4800
Pumice
Pit
4800
4735
31
Match Point Nn

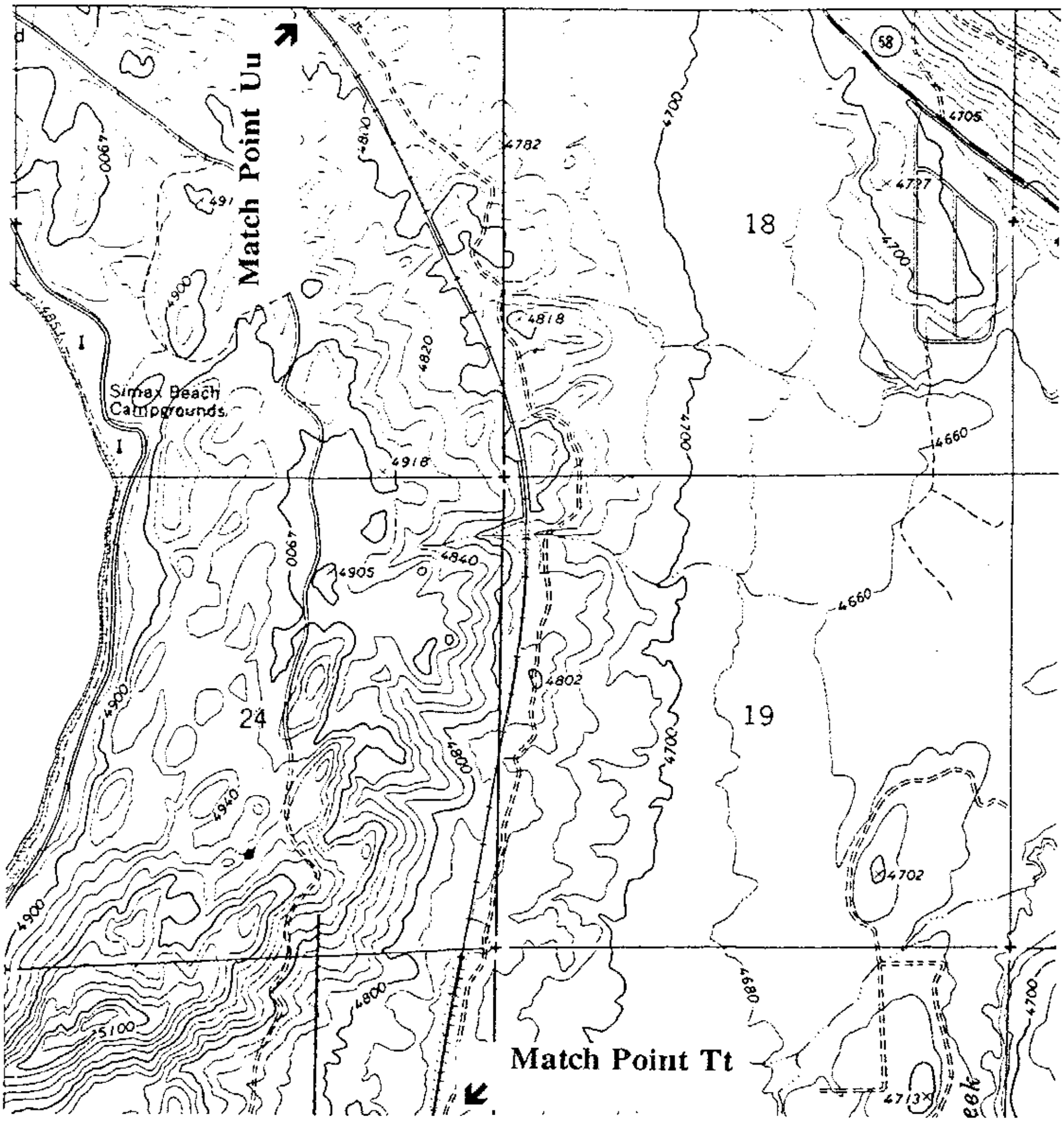

Match Point Pp
Match Point Oo
DESCHUTES
NATIONAL FORES
SOUTHERN PACIFIC
7
8
17
18
19
20
4840
4860
4866
4800
4700
4604
4620
4660
4640
4900
5000
5037
4762

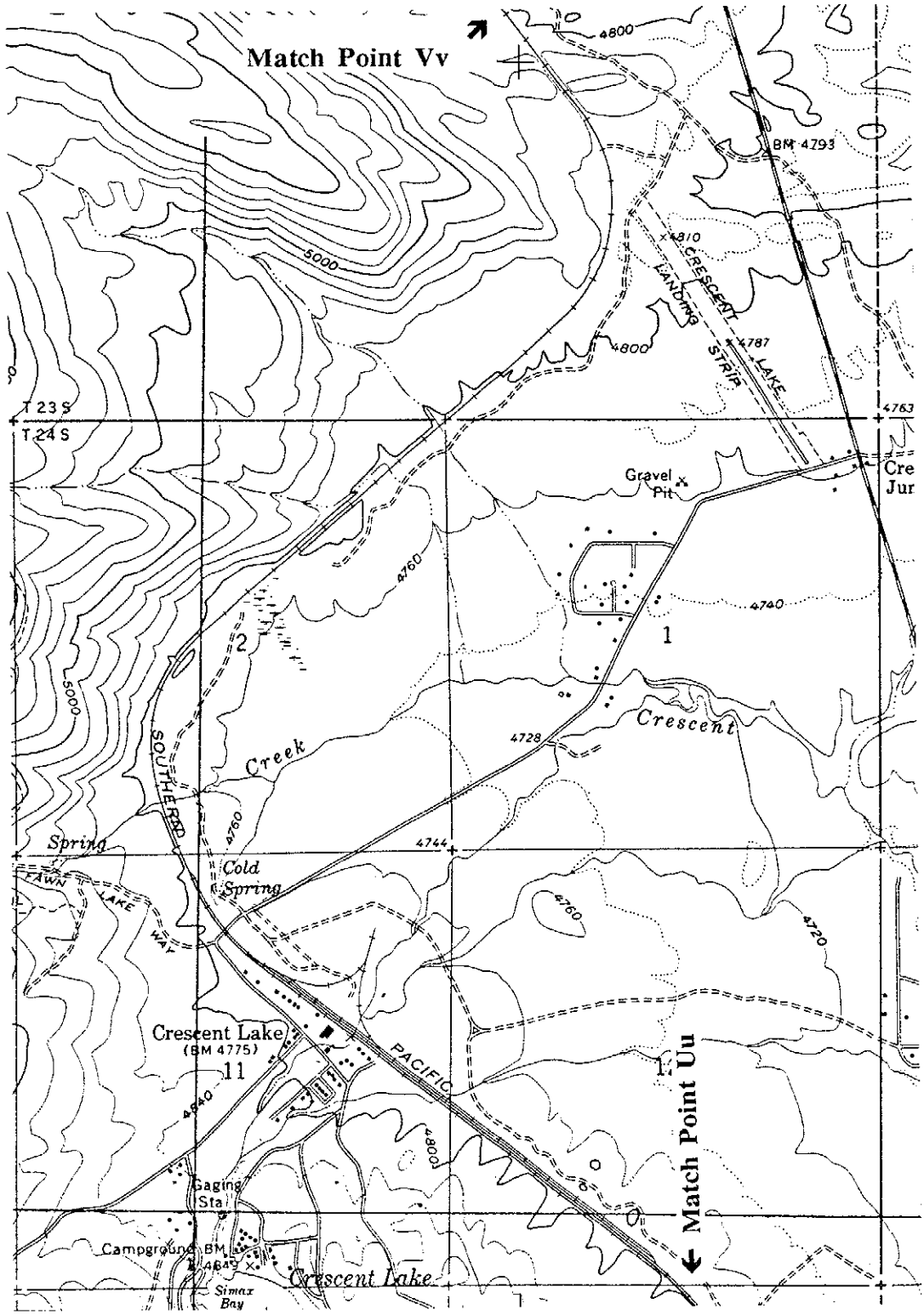

Match Point Qq
25
30
Mowich
River
Spring
Emigrant Crossing
SOUTHERN
PACIFIC
NORTHERN
KLAMATH
36
31
Gilchrist
Junction
Deschutes
Little
1
6
4744
4800
4722
4740
4760
4758
4738
4749
4700
4816
x4836
Match Point Pp

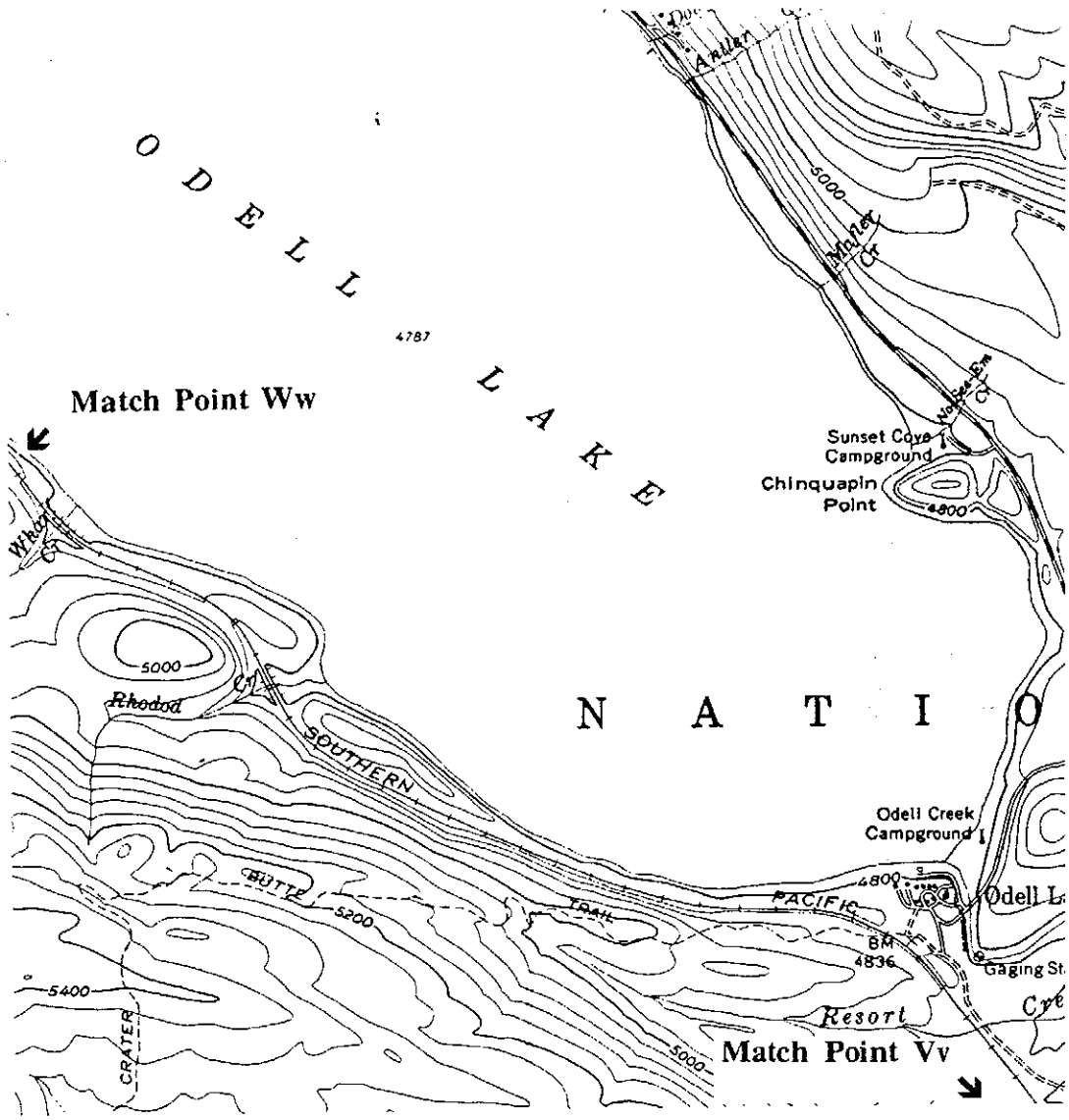

Match Point Rr
4700
4817
4800
4680
4741
15
14
4900
4797
SOUTHERN
4700
4600
5104
5000
4841
Bunny Butte
5000
5177
4700
4698
4800
22
23
4700
4760
4900
4700
PACIFIC
4781
4940
4840
Match Point Qq
4800
4899
5000
27
26
4960
4900
4800
Mowich

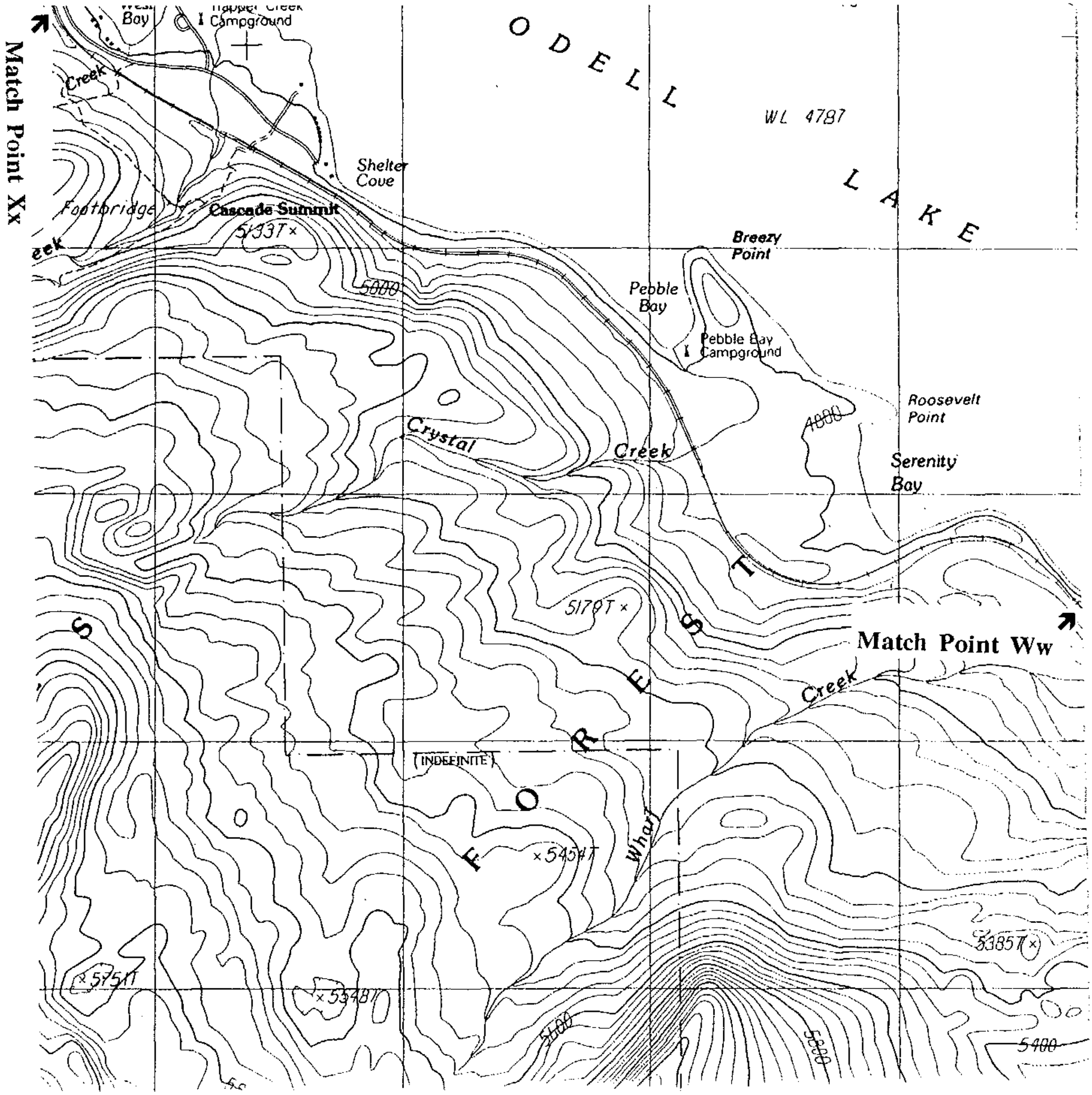

Match Point Ss
Spring
Little
Creek
Odell
F O R E S T
Match Point Rr

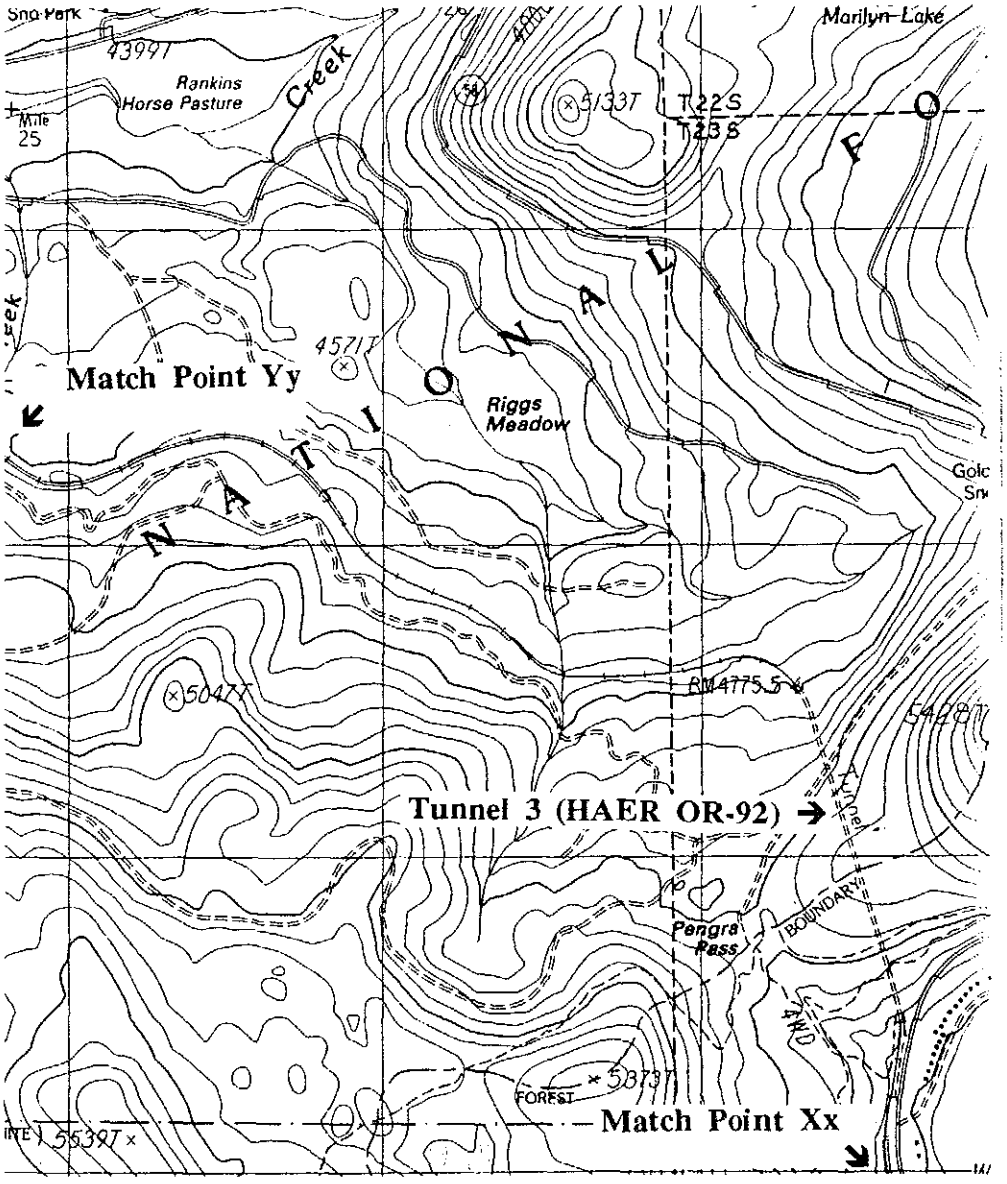

Match Point Tt
30
25
4800
4900
4700
4760
4875
Marsh
4740
4696
4745
D E S C H U T E
36
31
4821
Umli
Big
Creek
4730
4806
4760
Match Point Ss
1
O N A L
4800
4838
4850
4842
4720
4862
4823

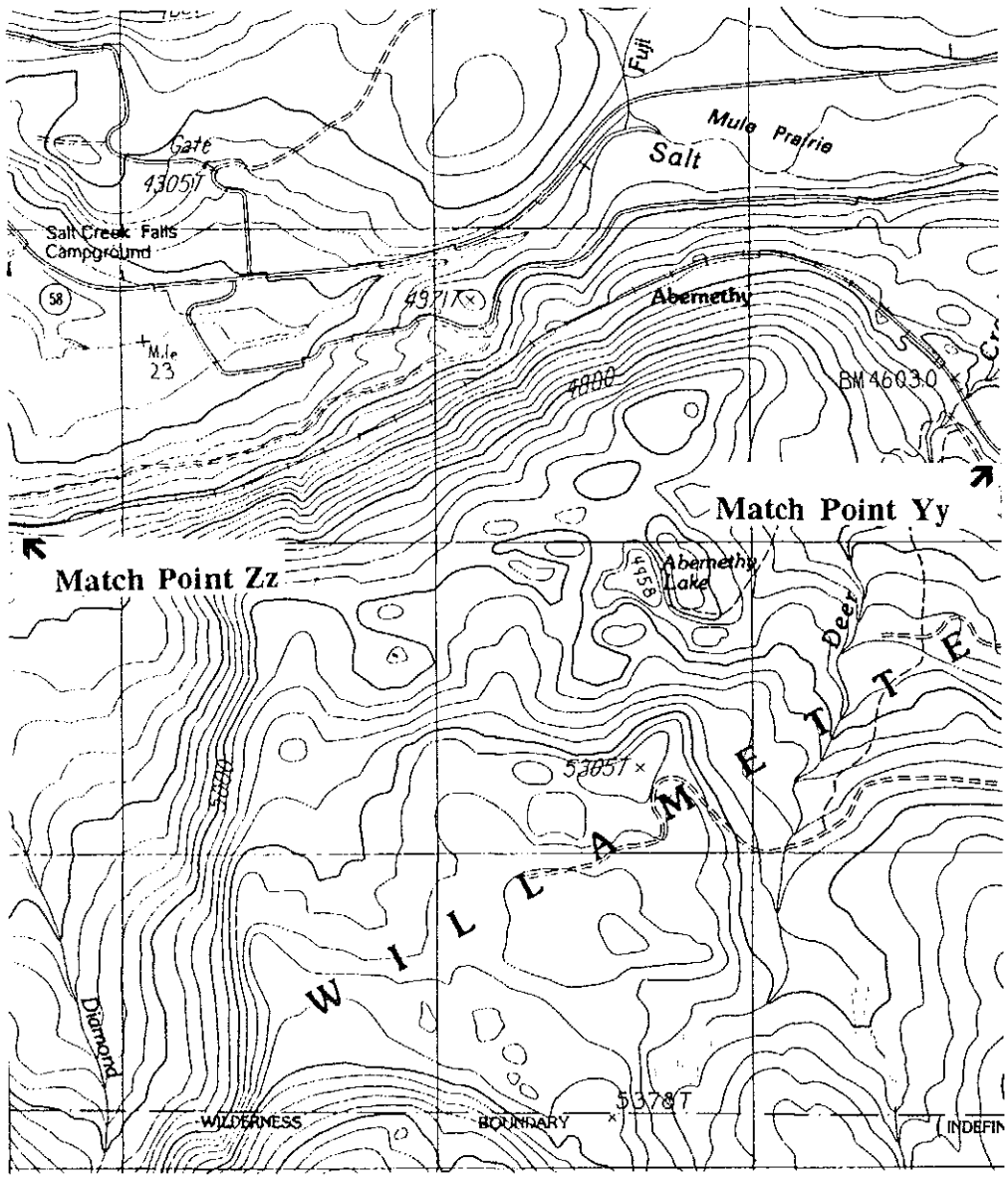

Match Point Uu
Simax Beach Campgrounds
18
19
24
4782
4818
4820
4918
4905
4840
4802
4700
4660
4705
4727
4702
4713
4900
4940
4800
5100
58
Match Point Tt

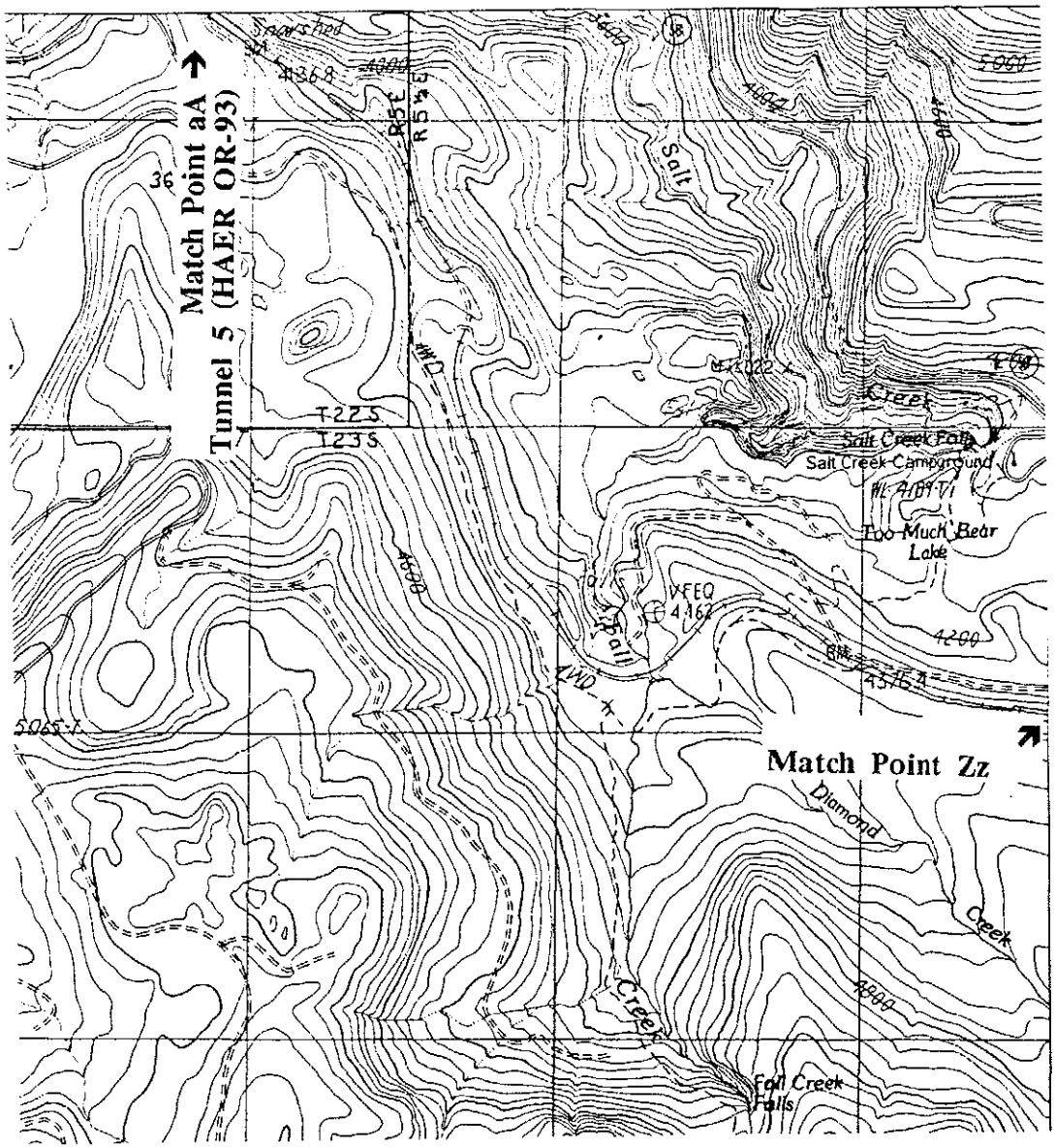

Match Point Vv
4800
BM 4793
5000
CRESCENT LANDING STRIP
4810
4787
LAKE
4800
T 23 S
T 24 S
4763
Gravel Pit
Cre
Jur
4760
4740
2
1
5000
SOUTH RD
Creek
Crescent
4728
Spring
4744
Cold Spring
FAWN LAKE WAY
4760
4720
Crescent Lake
(BM 4775)
11
12
PACIFIC
4840
4800
Gaging Sta
Campground BM
4849
Crescent Lake
Simax Bay
Match Point Uu

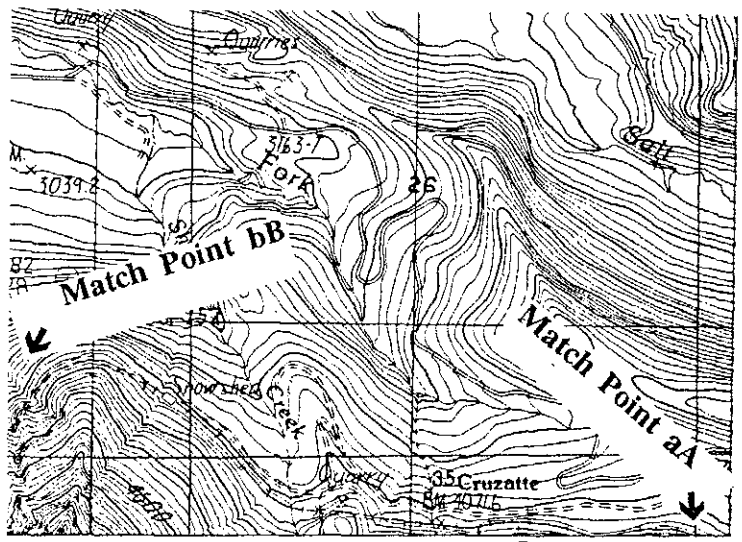

ODELL LAKE
4787
Match Point Ww
Sunset Cove
Campground
Chinquapin
Point
4800
5000
Rhodod
Cr
SOUTHERN
PACIFIC
TRAIL
BUTTE
5200
5400
CRATER
Odell Creek
Campground
Odell L.
BM
4836
Gaging St.
Resort
Match Point Vv
NATIO


Match Point Xx
Bay
Campground
ODELL
WL 4787
LAKE
Creek
Shelter Cove
Footbridge
Cascade Summit
5133T
Breezy Point
Pebble Bay
Pebble Bay Campground
5000
Roosevelt Point
4800
Crystal
Creek
Serenity Bay
5179T
Match Point Ww
Creek
S
T
S
E
R
O
F
(INDEFINITE)
O
Wharf
5454T
5385T
5751T
5348T
5400

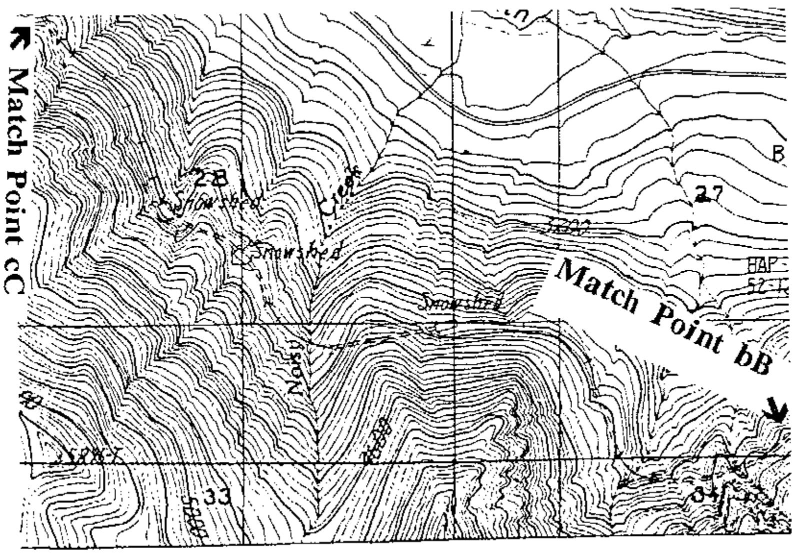

Marilyn Lake
Rankins
Horse Pasture
Creek
Mile
25
5133T
T 22 S
T 23 S
4571T
Match Point Yy
Riggs
Meadow
5047T
RM 4775.5
Tunnel 3 (HAER OR-92)
Pengra
Pass
BOUNDARY
FOREST
5373T
Match Point Xx
5539T

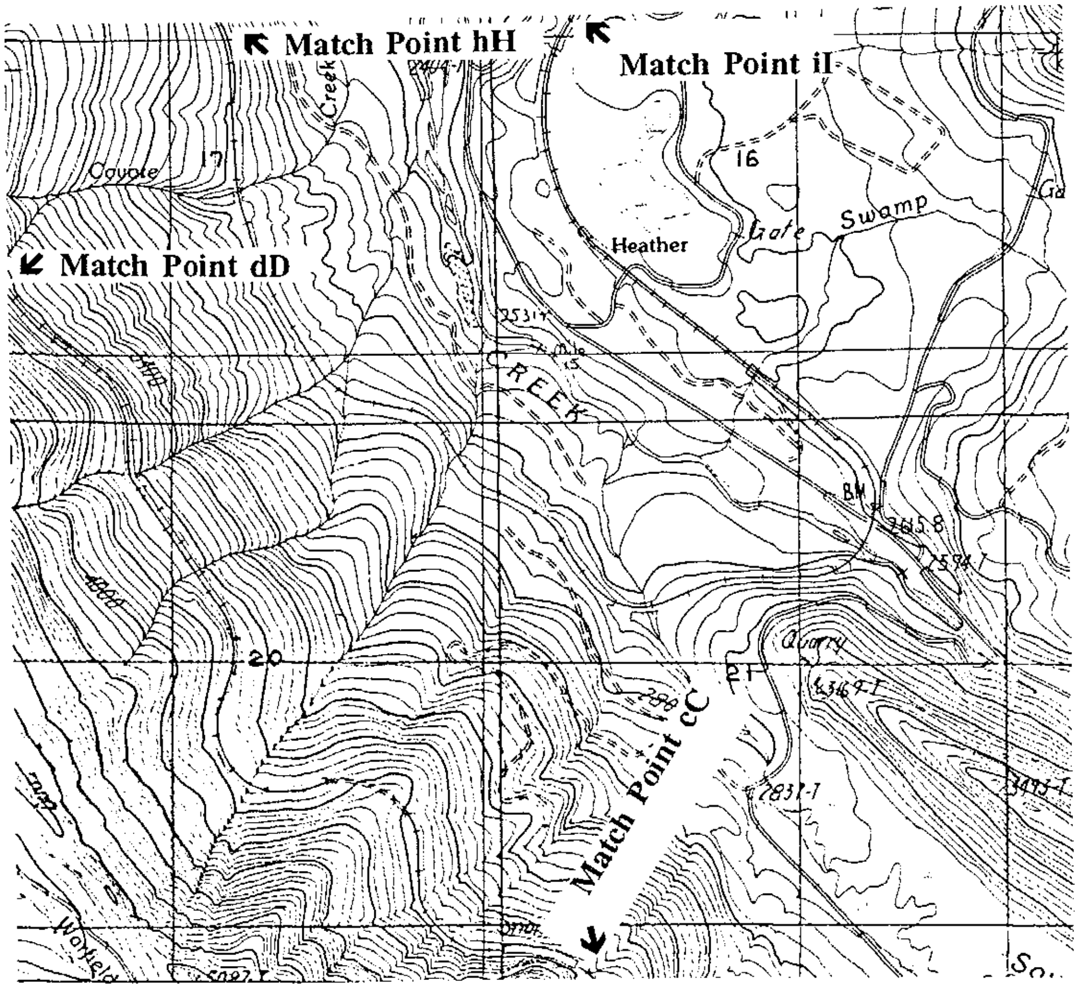

Fuji
Mule Prairie
Salt
Gate
4305T
Salt Creek Falls
Campground
58
Mile
23
4971
Abernethy
4800
BM 4603.0
Match Point Yy
Match Point Zz
Abernethy
Lake
4558
Deer
5000
53057
WILLAMETTE
Diamond
WILDERNESS
BOUNDARY
5378T
INDEFIN

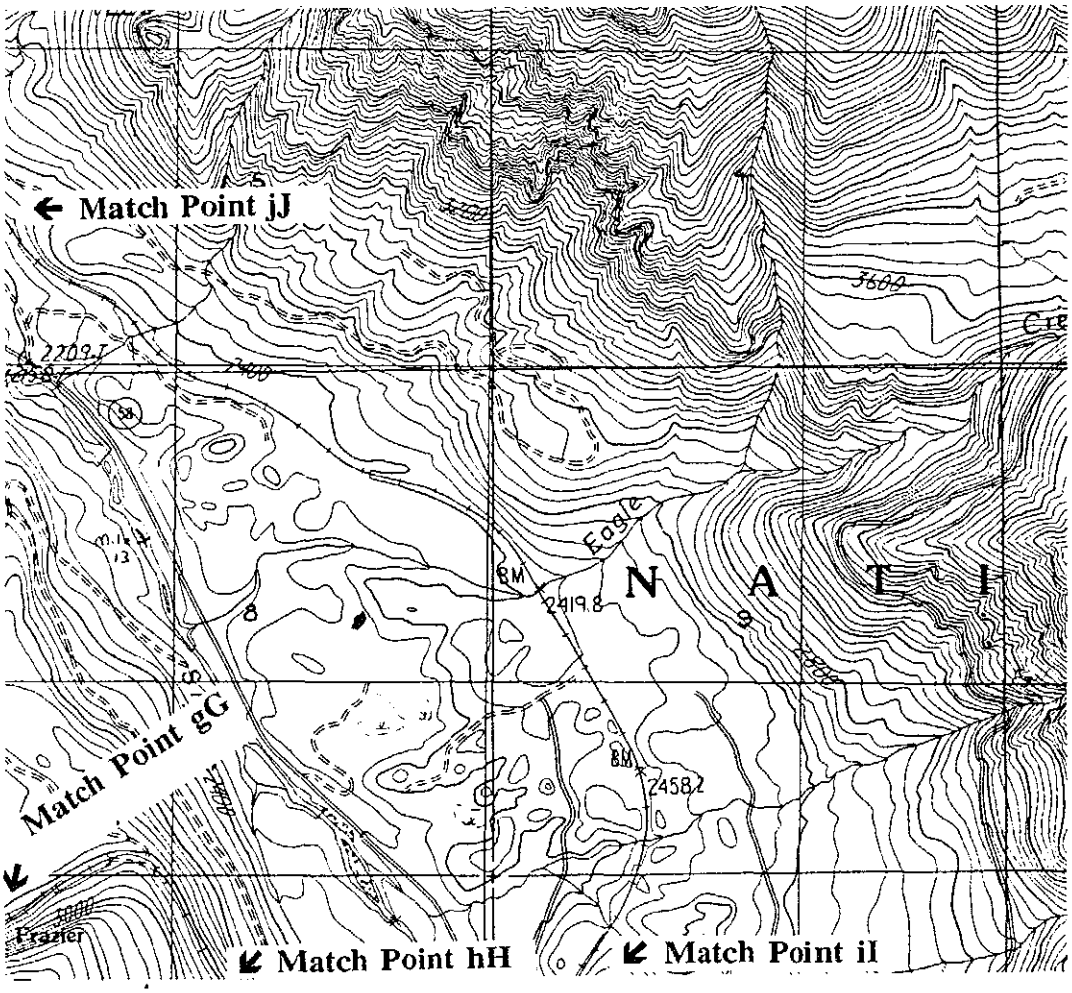

Match Point aA
Tunnel 5 (HAER OR-93)
Match Point Zz
Salt Creek Falls
Salt Creek Campground
Too Much Bear Lake
Diamond Creek
Fall Creek Falls
T22S
T23S
R5½E

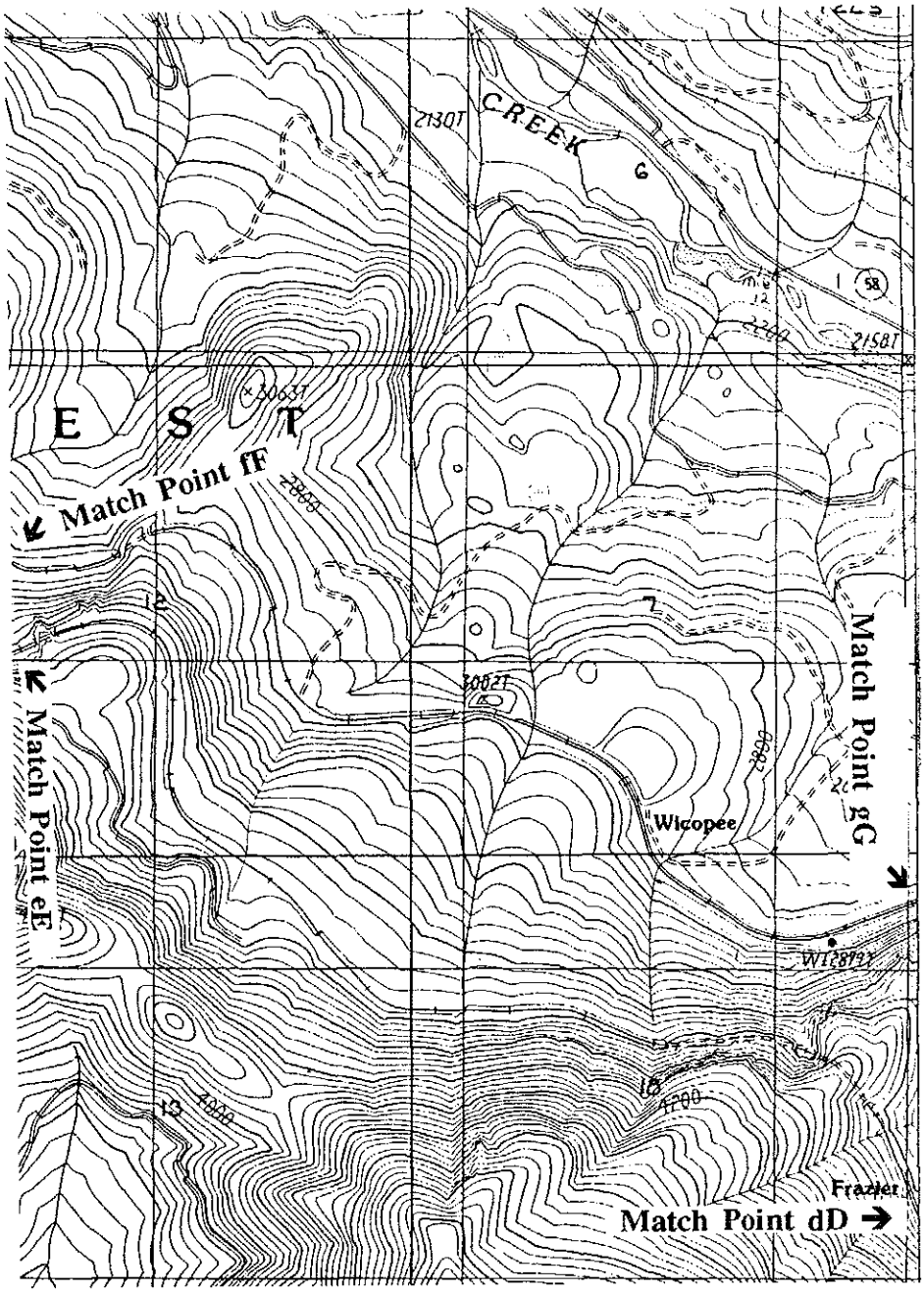


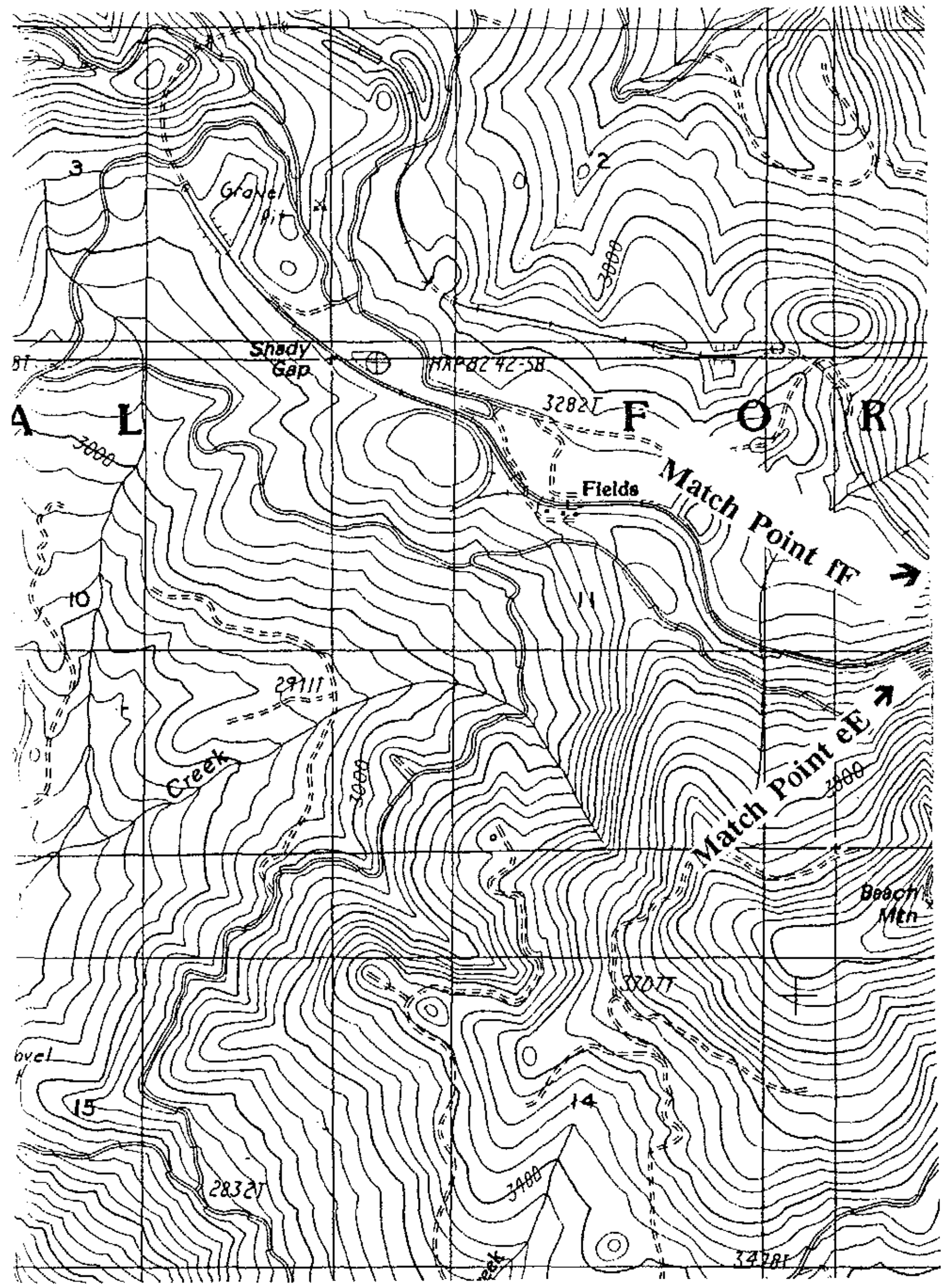
Cruzatte Tank (HAER OR-96)

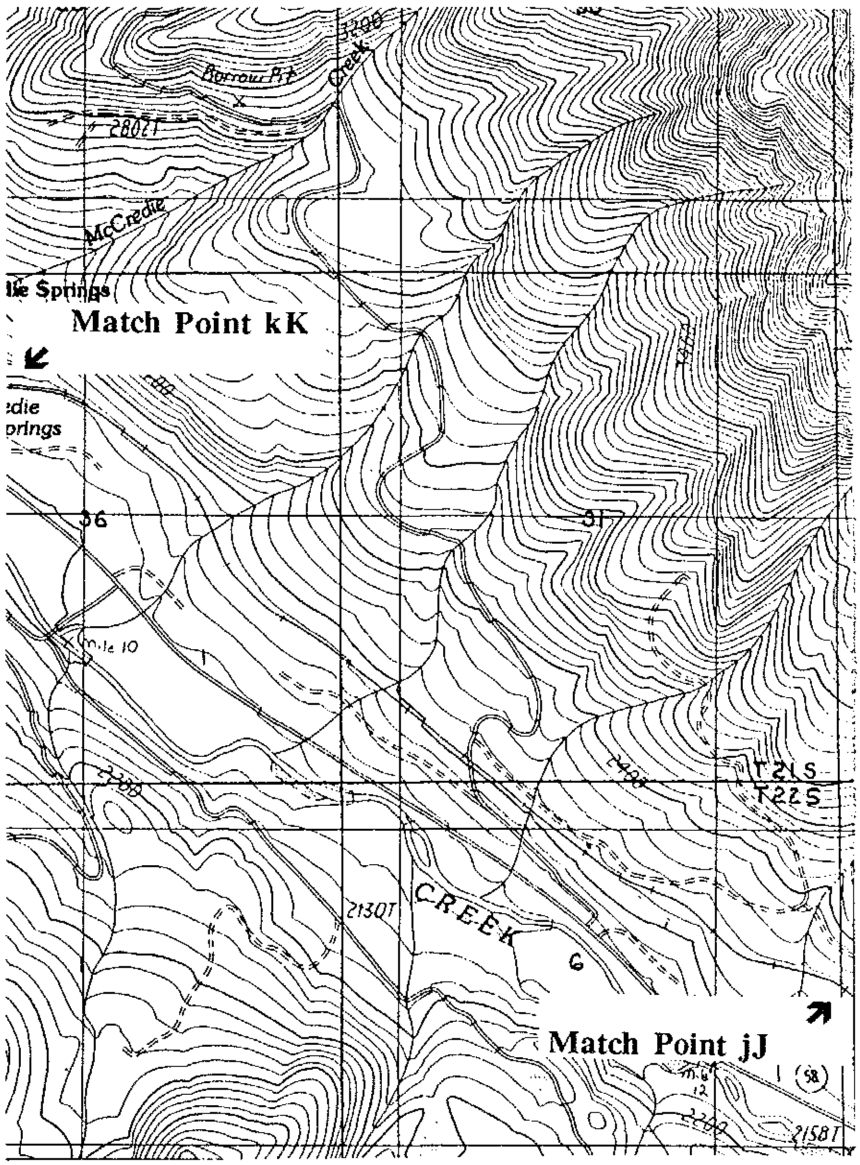

Match Point cC
Match Point bB
28
27
33
34
Snowshed
Snowshed
Snowshed
Noisy
Creek

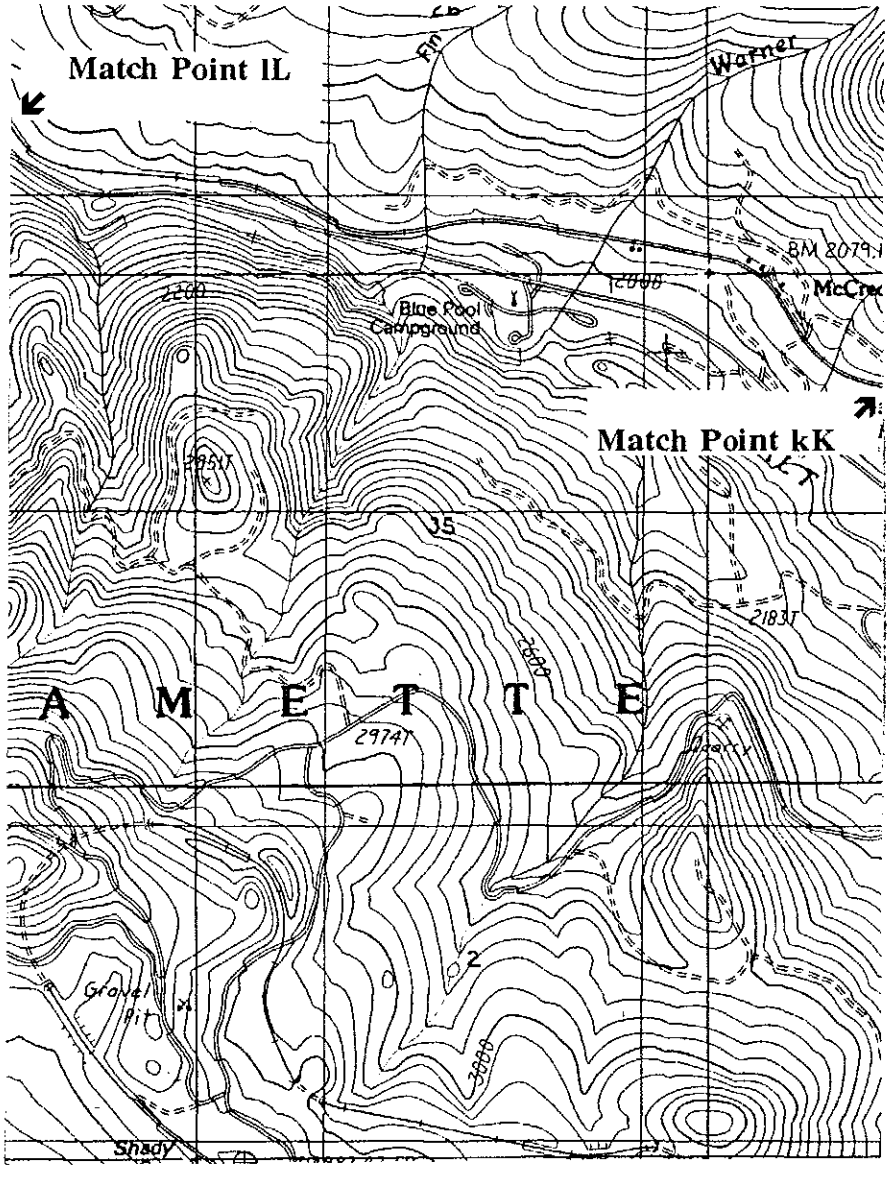

Match Point hH
Match Point iI
Match Point dD
Match Point cC
Coyote
Creek
17
16
Heather
Gate Swamp
CREEK
BM
Quarry
20
21

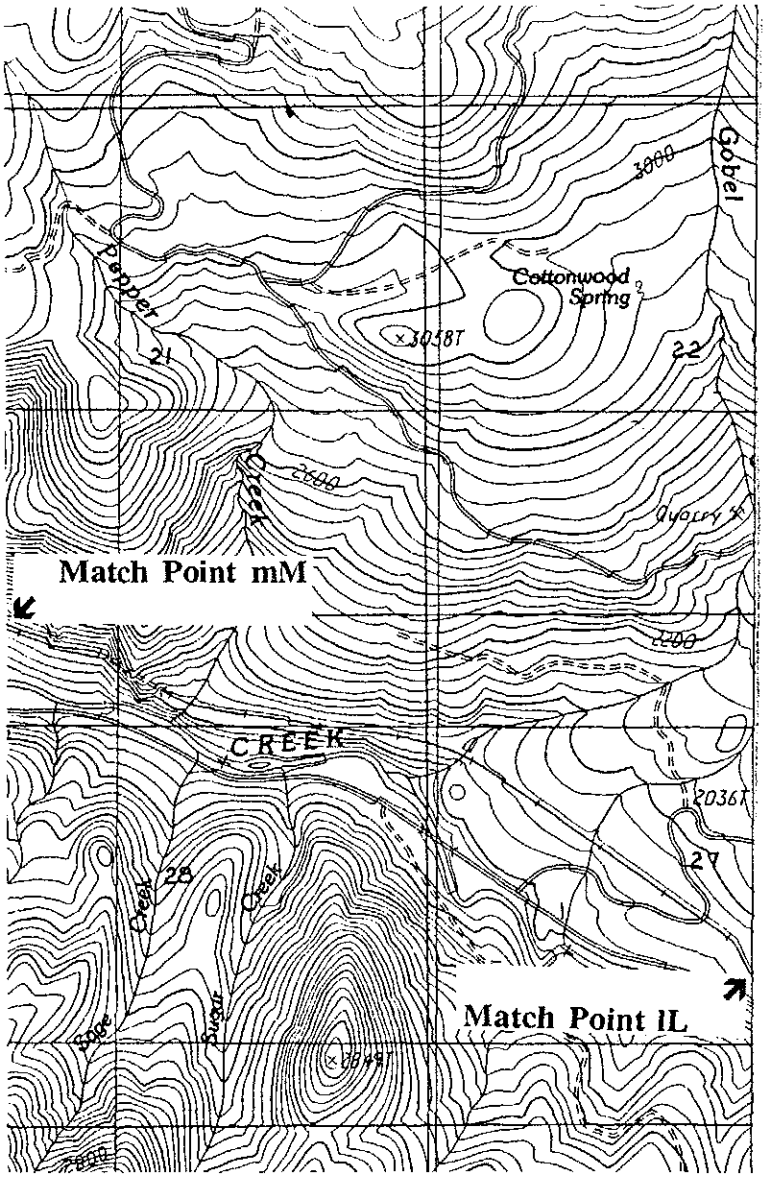

Match Point jJ
Match Point gG
Match Point hH
Match Point iI
Eagle
BM
2419.8
BM
2458.2
N
A
T
I
Frazier

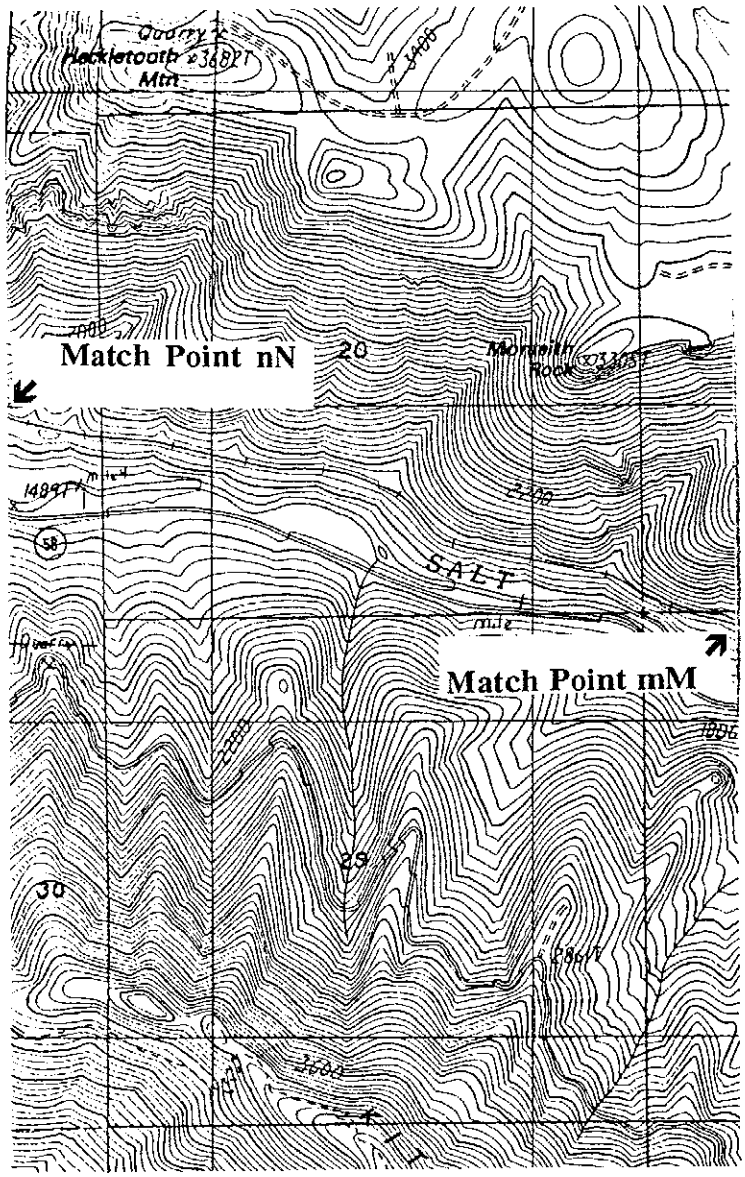

CREEK
E S T
Match Point fF
Match Point eE
Match Point gG
Match Point dD
Wicopee
Frazier

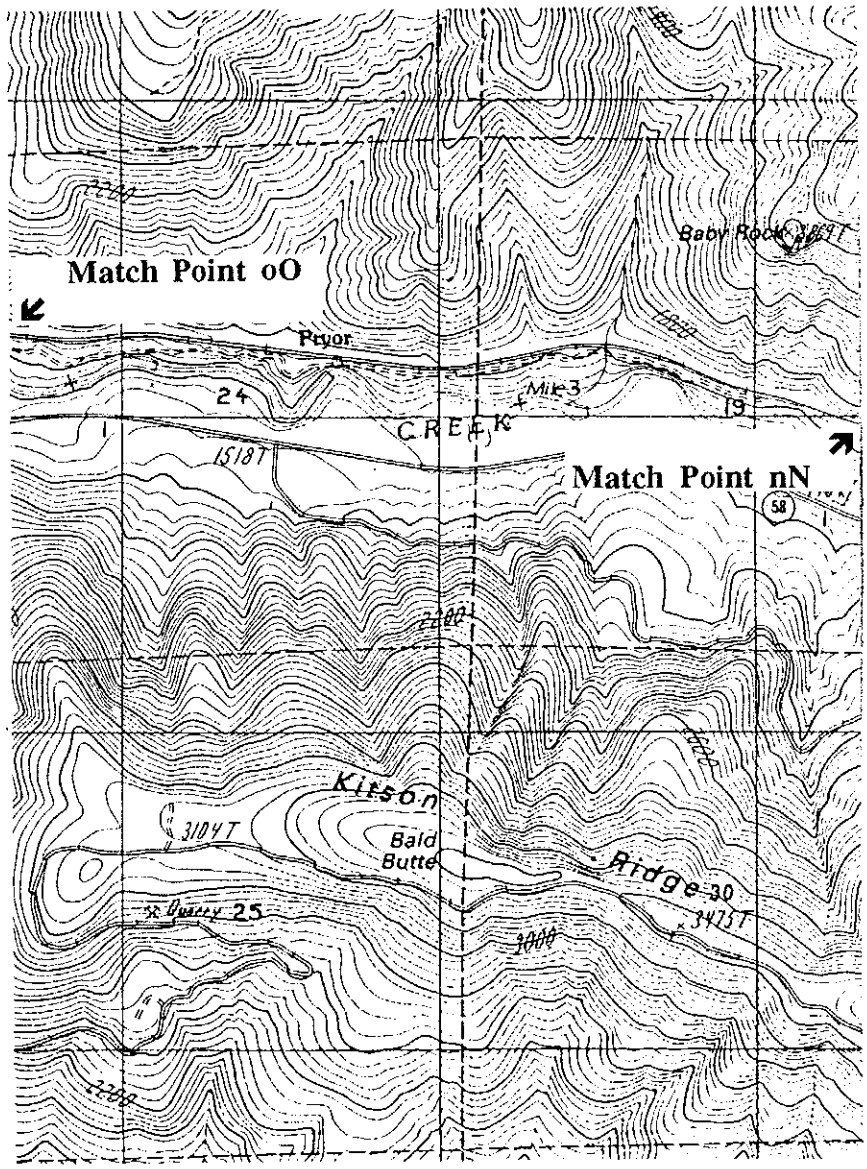

Gravel Pit
Shady Gap
3282
A L F O R
Fields
Match Point fF
Match Point eE
Creek
2911
3000
3400
3307
2832
3428
Beach Mtn
3
2
10
11
15
14

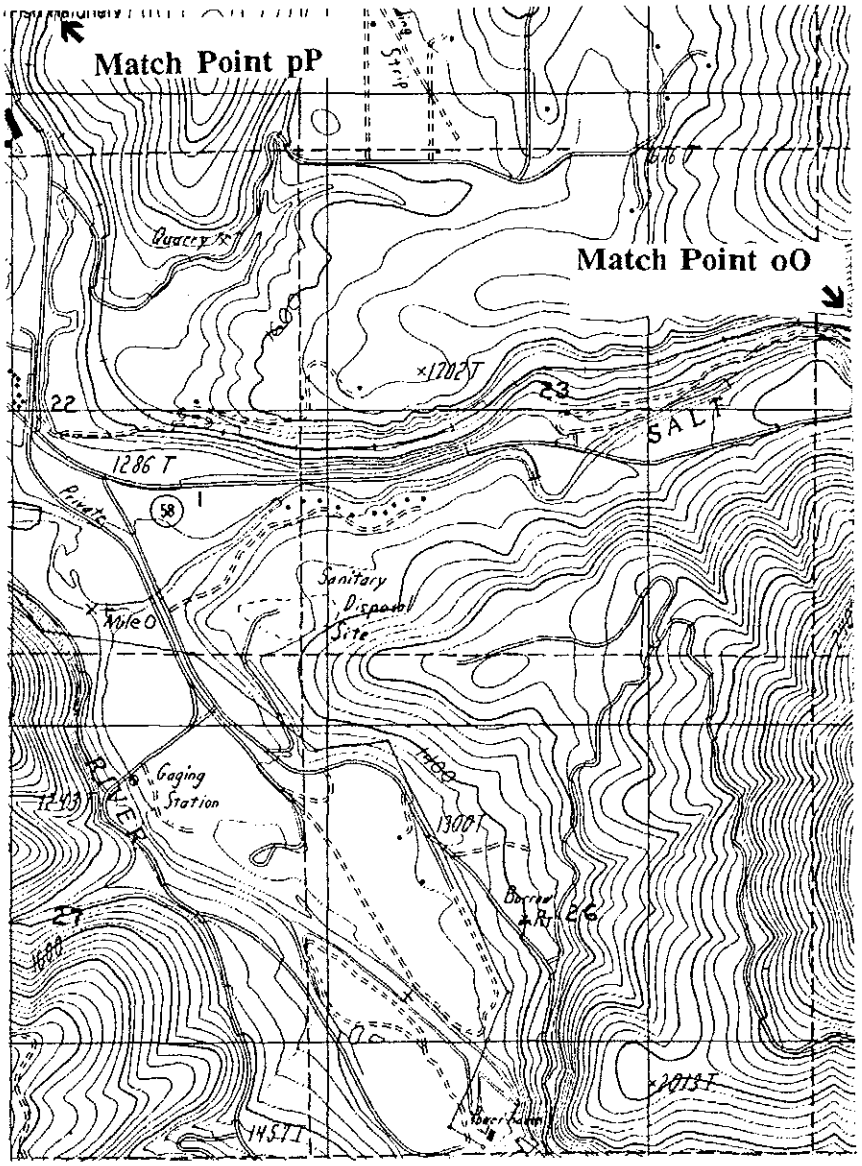

Match Point kK
Match Point jJ
McCredie
Creek
Borrow Pit
2802T
36
31
T21S
T22S
CREEK
2130T
2158T
6

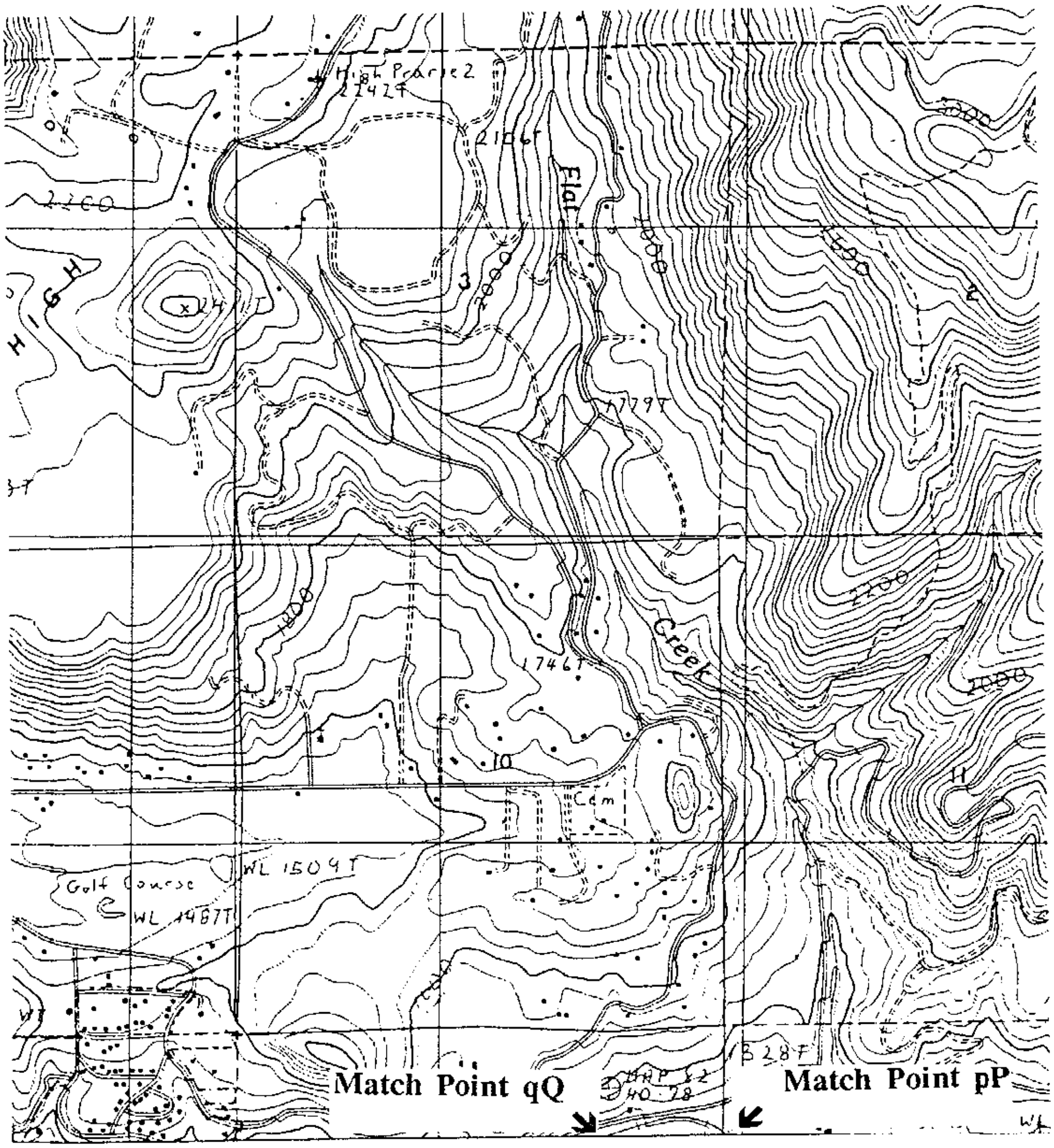

Match Point lL
Warner
Blue Pool Campground
Match Point kK
JS
A M E T T E
2974T
2183T
Gravel Pit
Shady

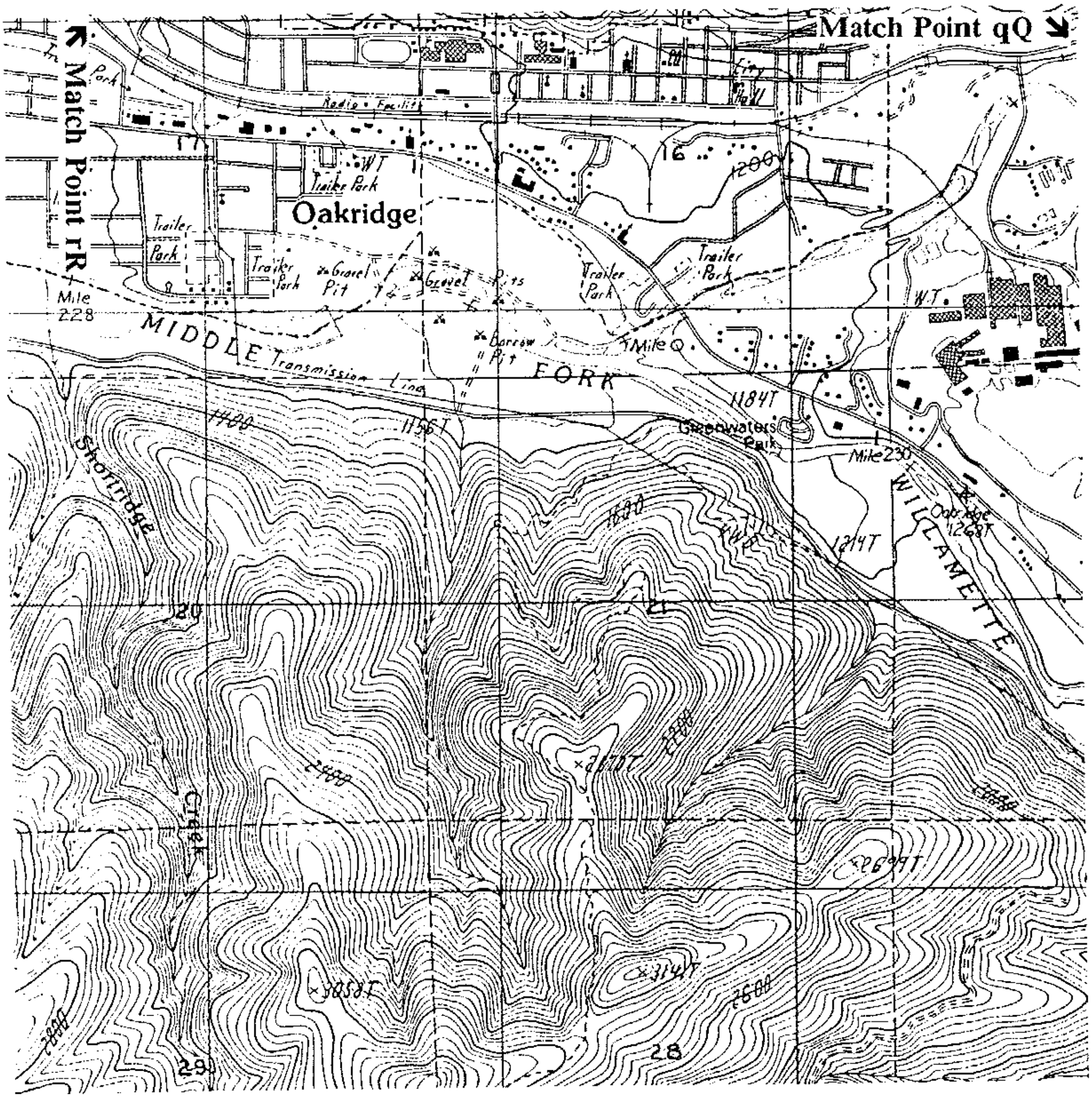

Gobel
3000
Pepper
Cottonwood Spring
3058T
21
22
Creek
2600
Match Point mM
CREEK
2036T
27
28
Creek
Creek
Sugar
Edge
Match Point lL

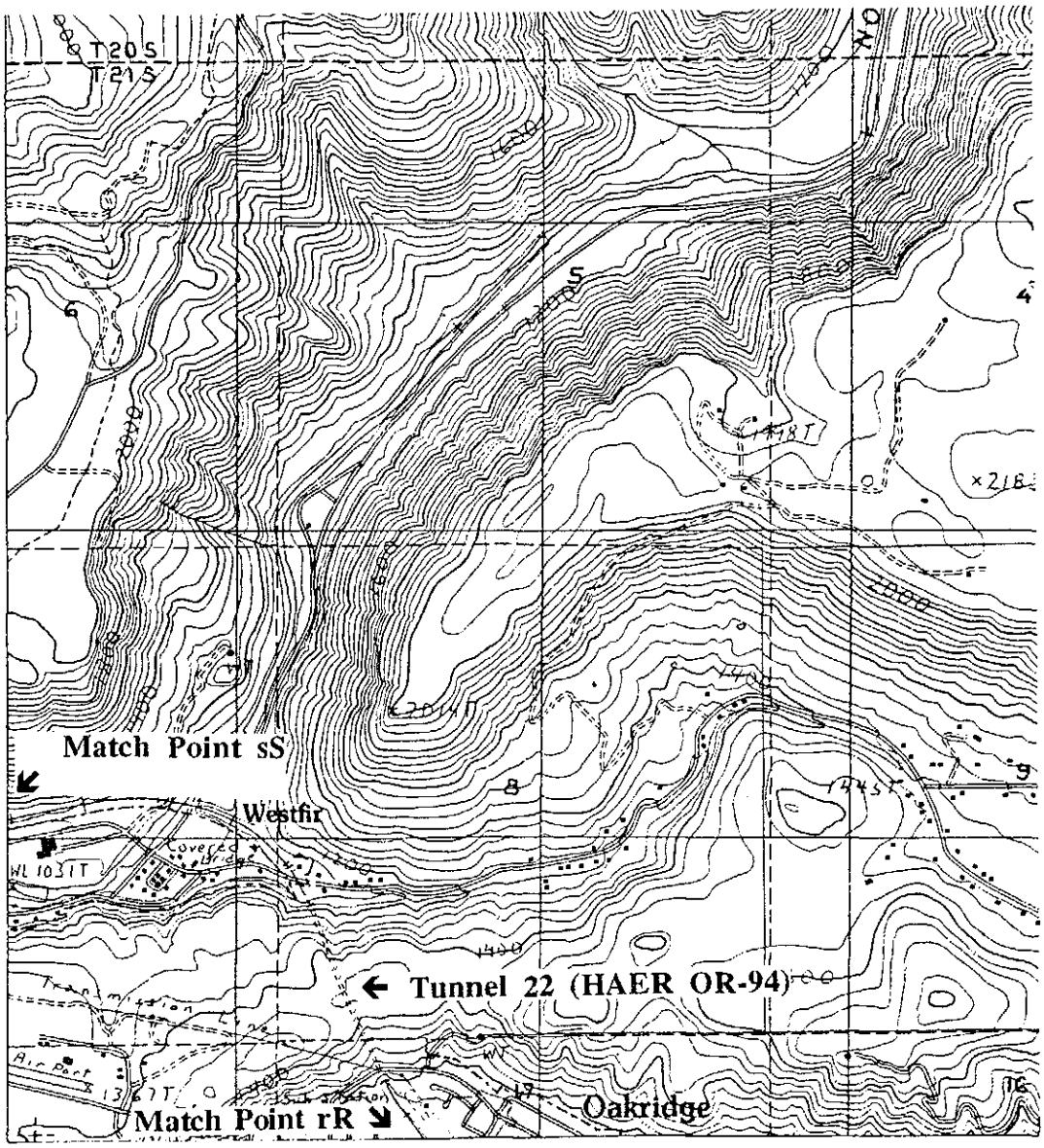

Match Point nN
Match Point mM
SALT
20
29
30

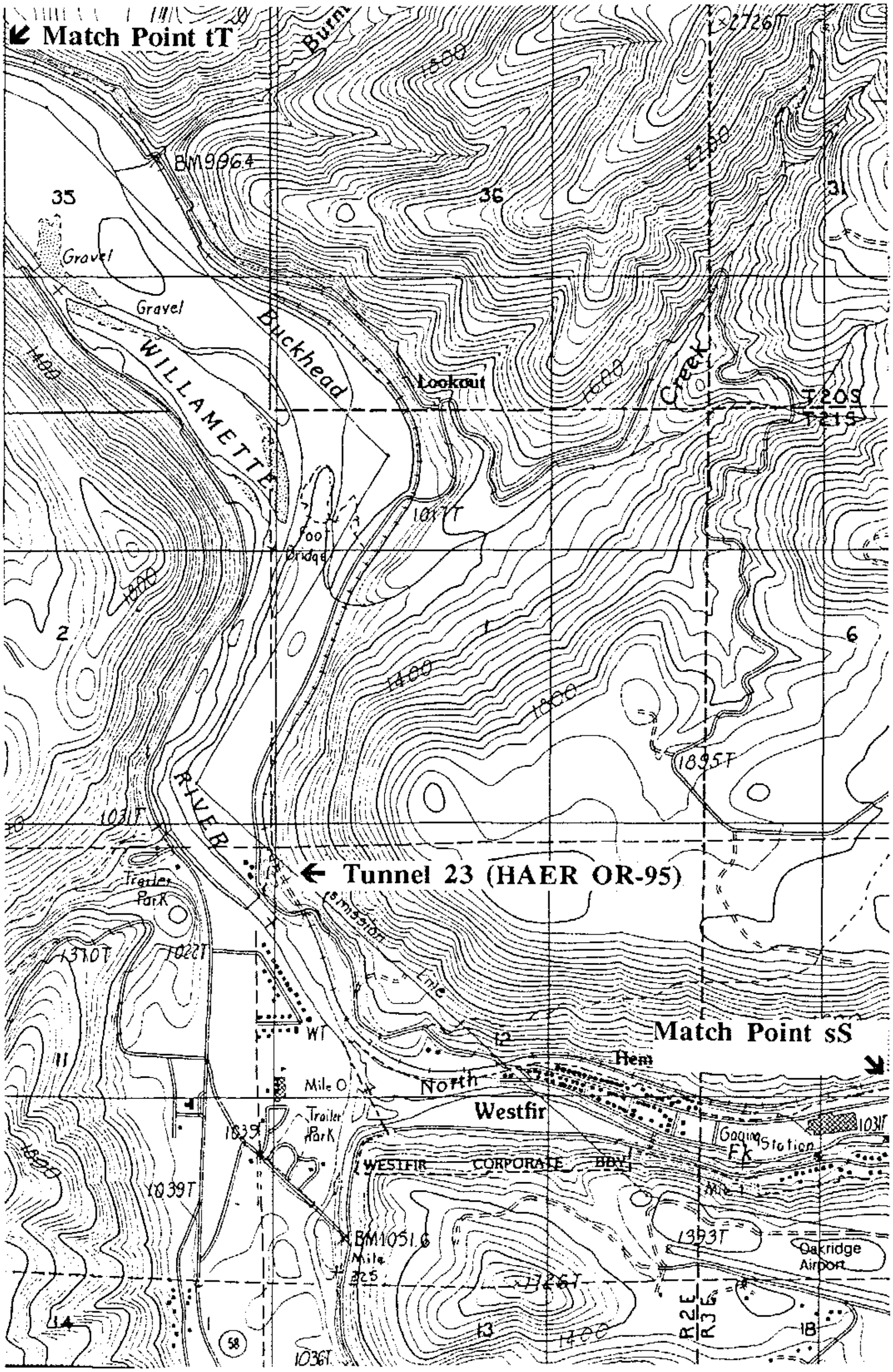

Match Point oO
Pryor
Mile 3
24
19
CREEK
Match Point nN
58
Kirson
Bald Butte
Ridge
30
25
3104T
3475T
Baby Rock

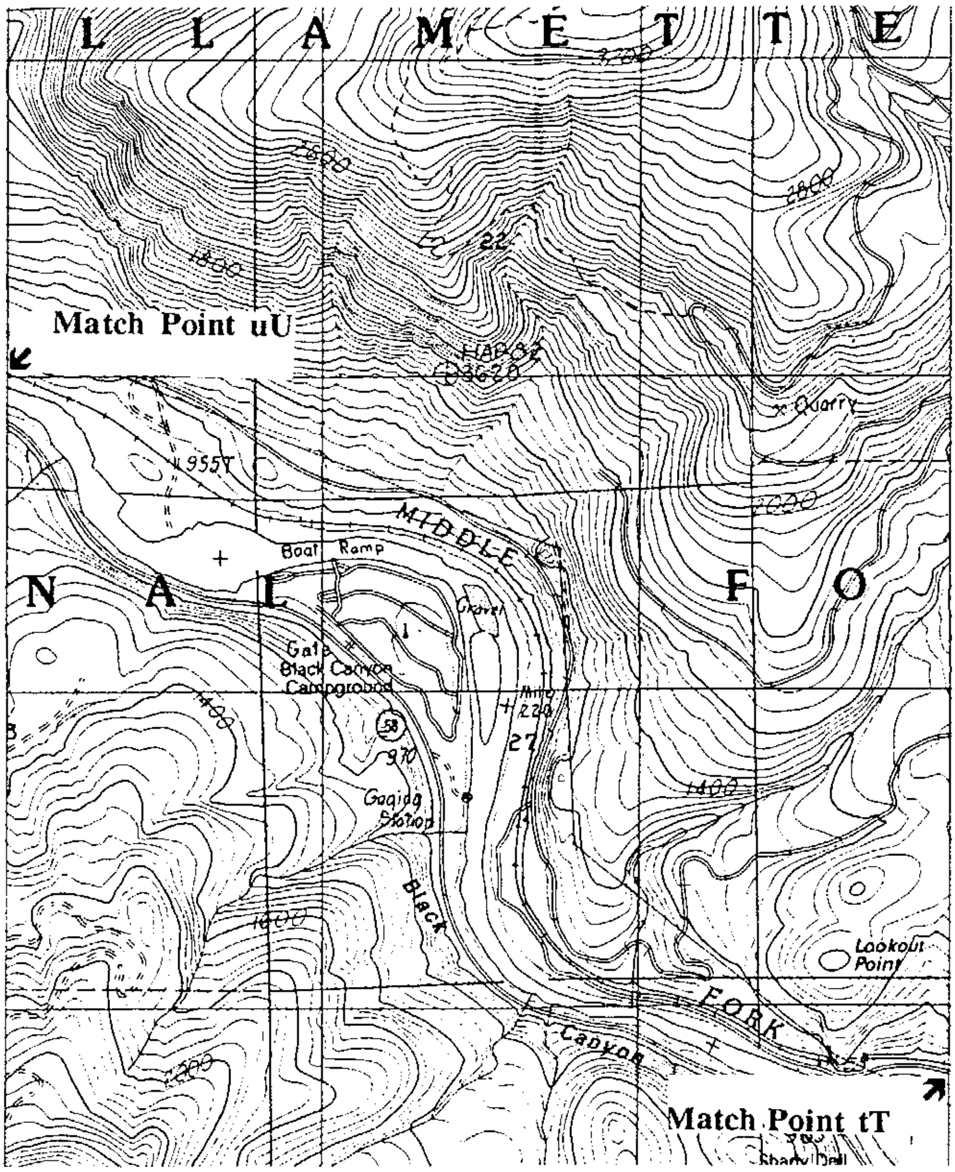

Match Point pP
Match Point oO
Quarry
1700T
22
23
SALT
1286 T
58
Private
Sanitary
Disposal
Site
Mile 0
Gaging
Station
RIVER
1300T
Borrow
Pit
27
1451T
2011T

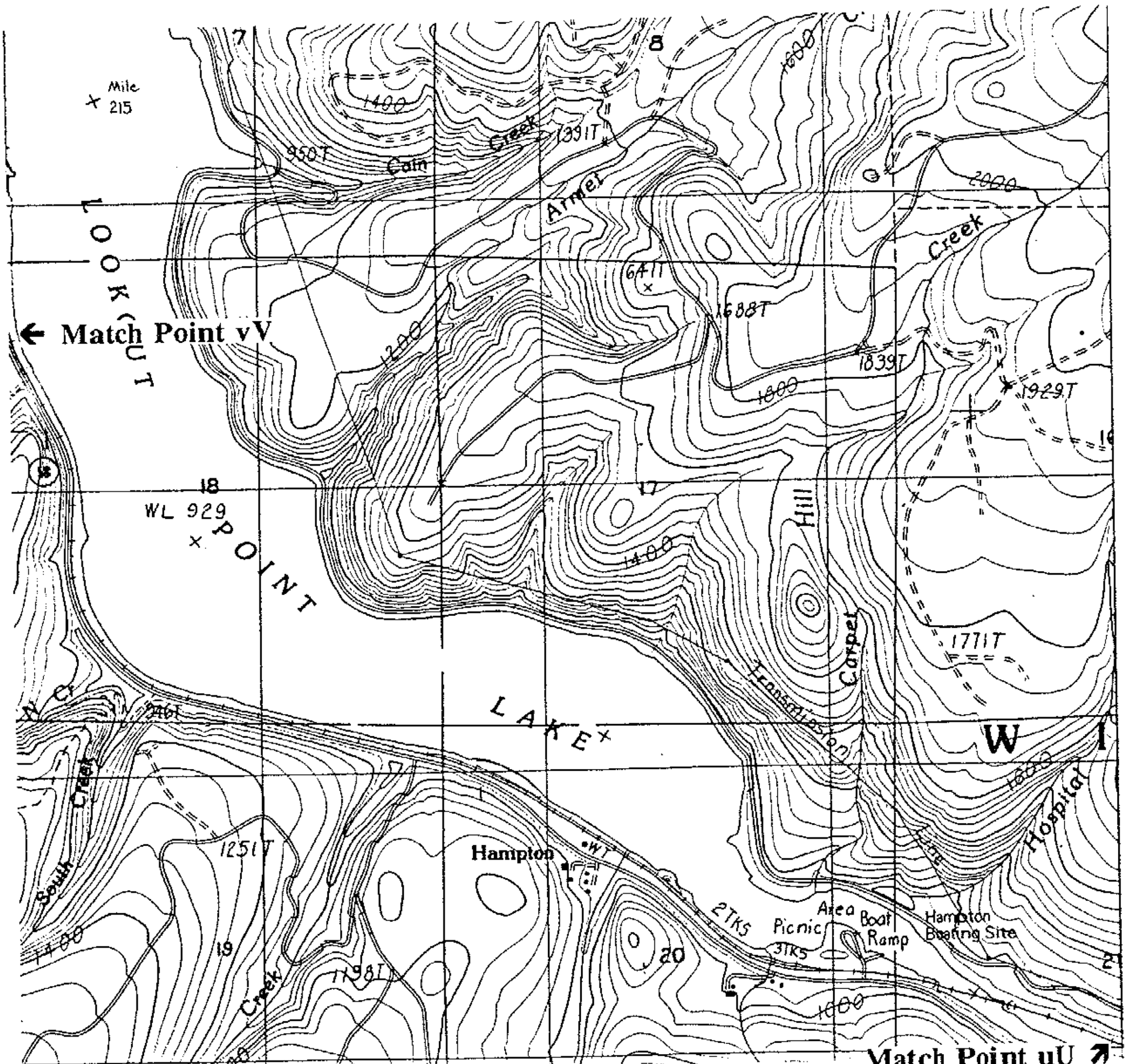

High Prairie 2
2142T
2106T
2200
Flat
Creek
1779T
1746T
Cem
Golf Course
WL 1509T
WL 1487T
Match Point qQ
Match Point pP

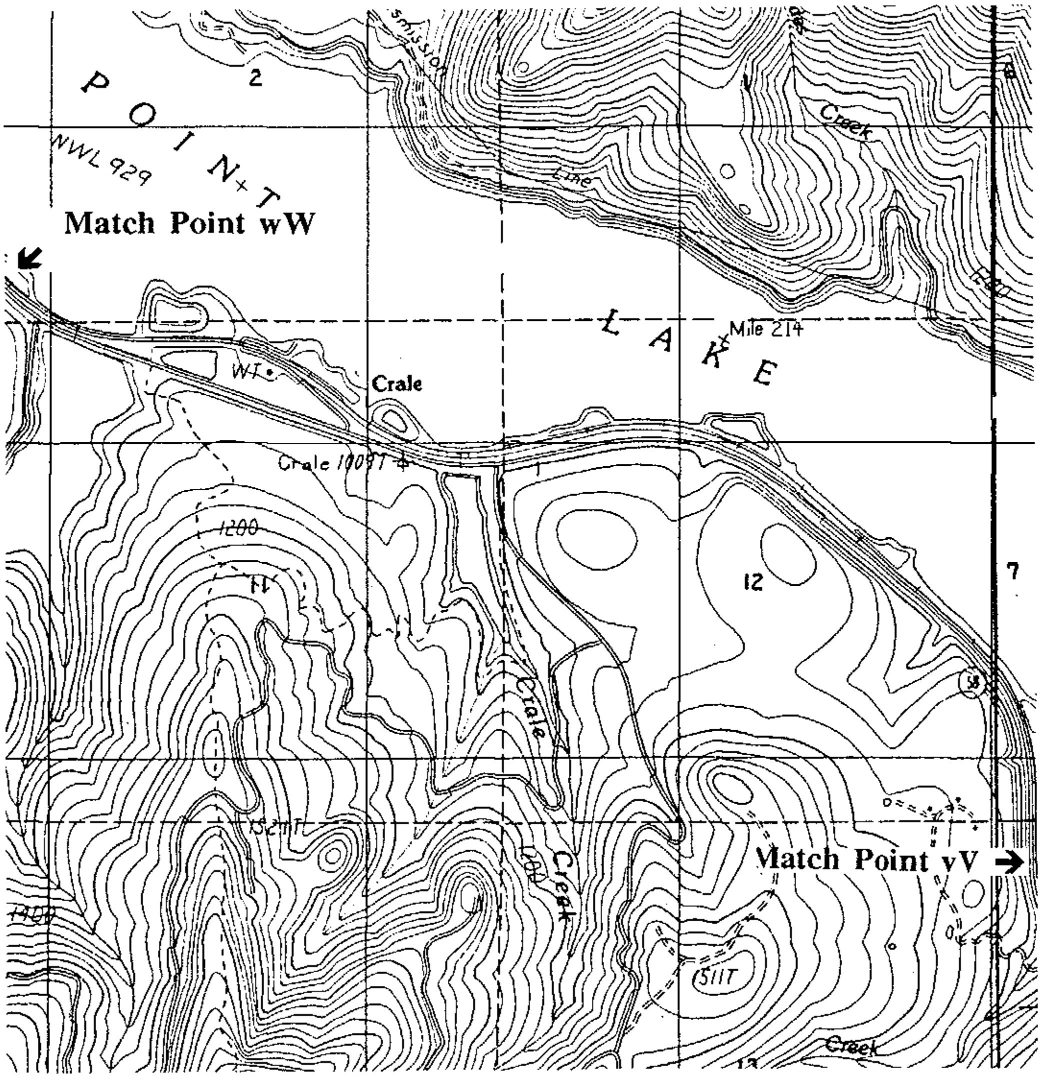

Match Point qQ
Match Point rR
Oakridge
Trailer Park
Gravel Pit
Gravel Pits
Borrow Pit
Mile 228
MIDDLE
Transmission Line
FORK
WILLAMETTE
Greenwaters Park
Mile 230
City Hall
Radio Facility
Shortridge
Creek
1184T
1156T
1214T
1200
1400
1600
2400
2699T
3058T
3147T
2600
16
17
20
21
28
29

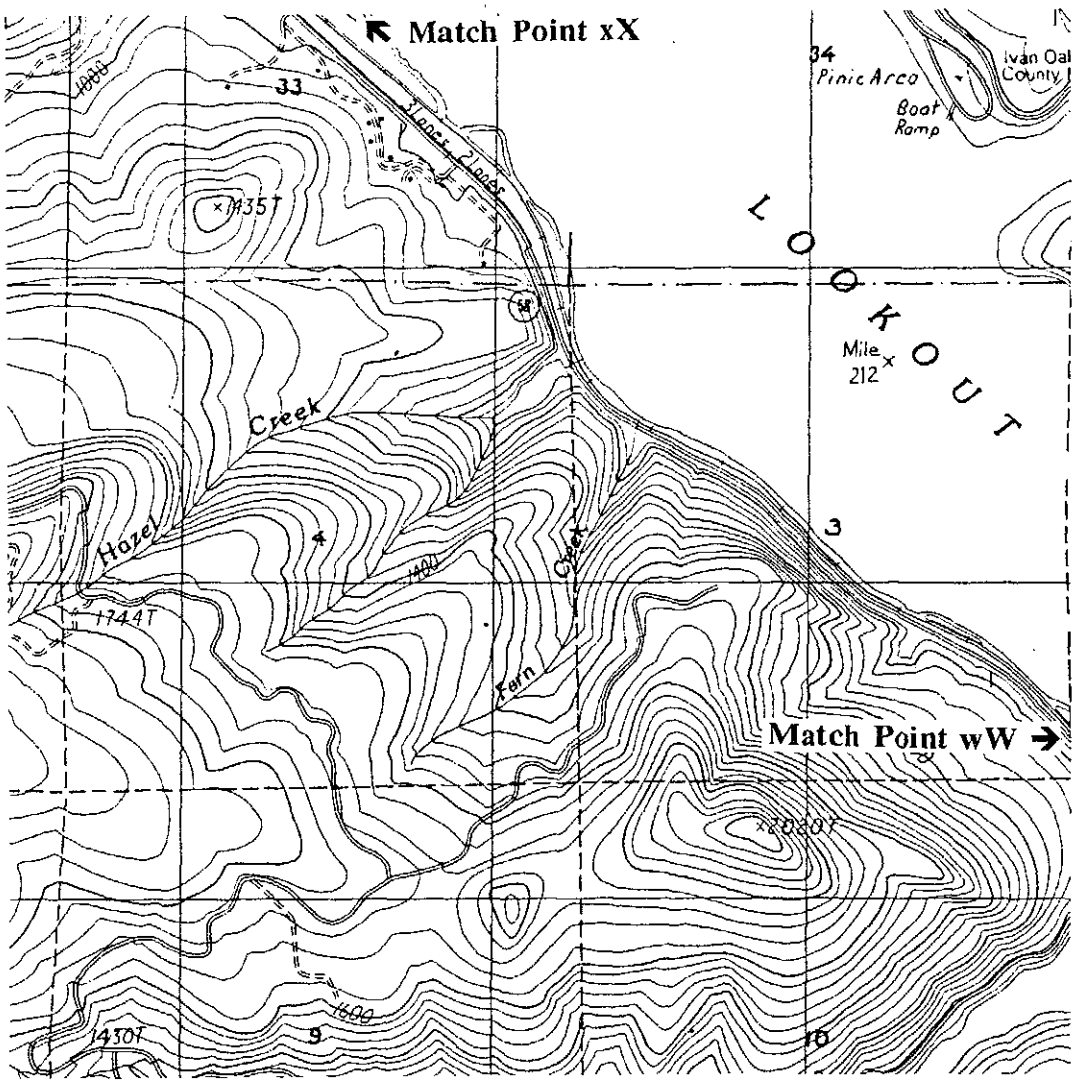

T20S
T21S
Match Point sS
Westfir
Tunnel 22 (HAER OR-94)
Match Point rR
Oakridge

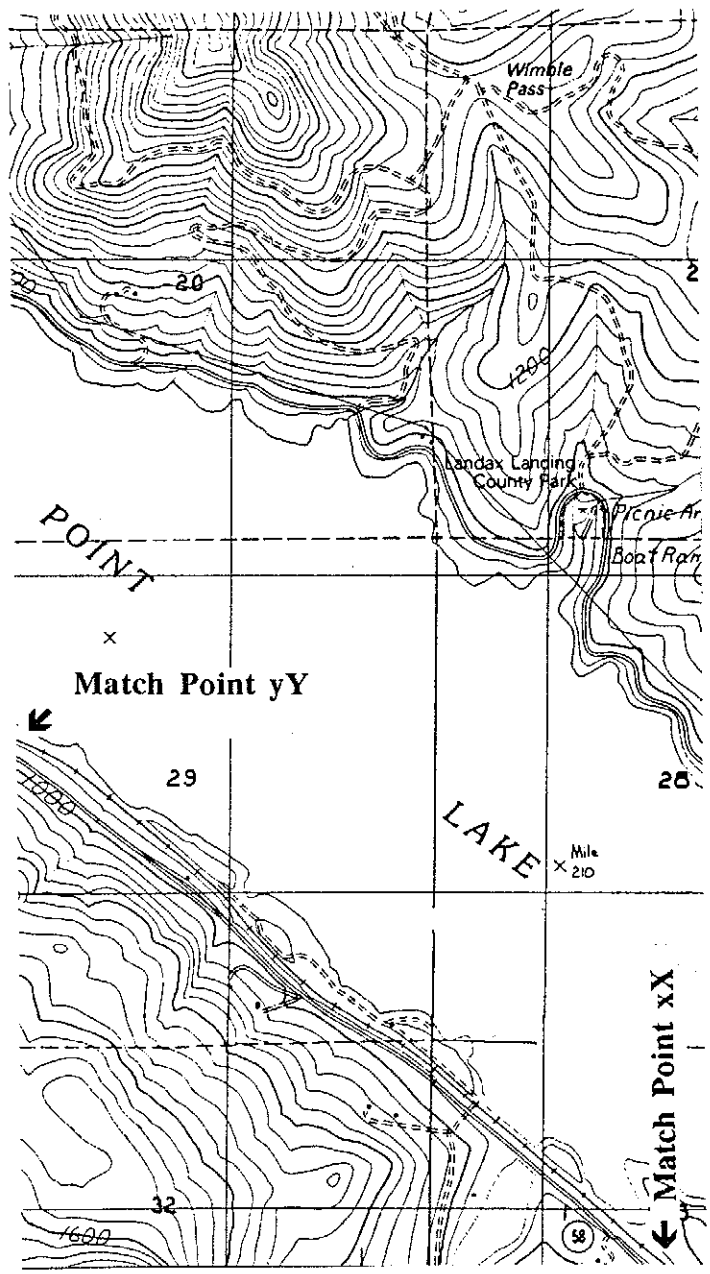

Match Point tT
Tunnel 23 (HAER OR-95)
Match Point sS
WILLAMETTE
RIVER
Buckhead
Creek
Lookout
Gravel
Gravel
Foot Bridge
Trailer Park
Trailer Park
North
Westfir
Hem
WESTFIR CORPORATE BDY
Gaging Station
Oakridge Airport
BM996.4
BM1051.6
Mile 0
T20S
T21S
R2E
R3E

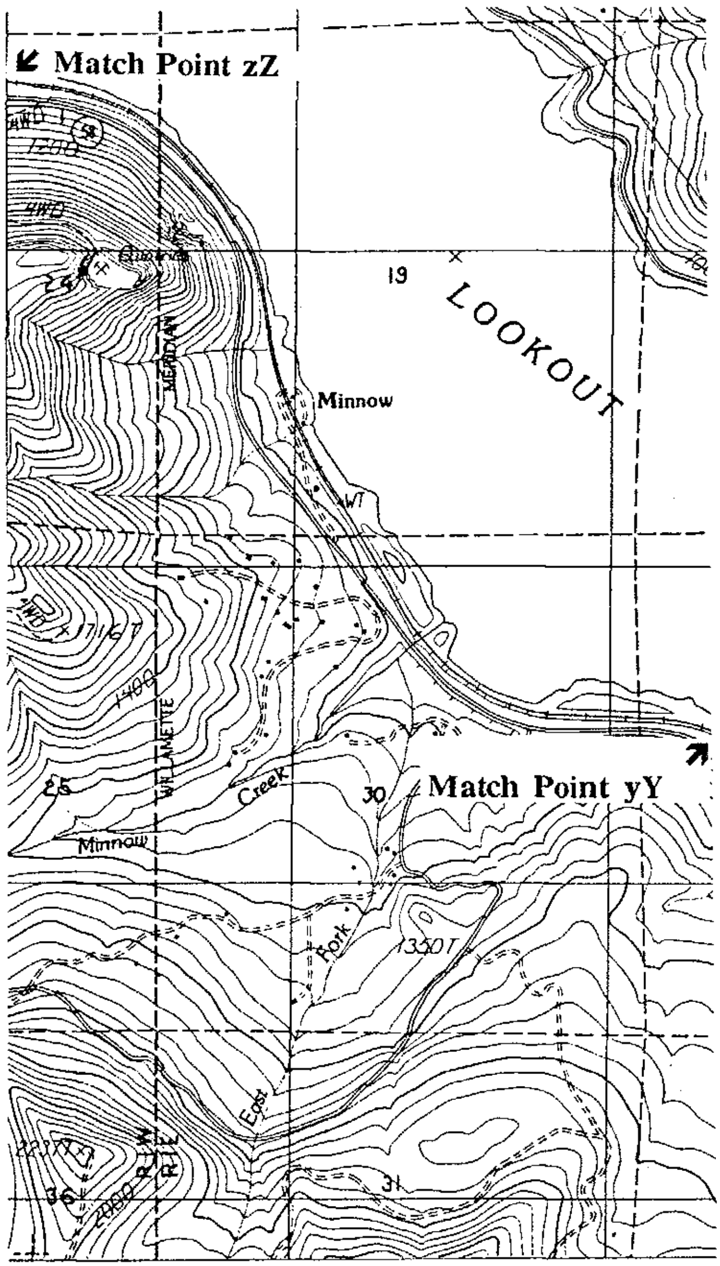

L L A M E T T E
N A L
F O
Match Point uU
Match Point tT
MIDDLE
FORK
Boat Ramp
Gate
Black Canyon Campground
Gaging Station
Black
Canyon
Quarry
Lookout Point
Gravel
955T
970
2800
1800
1400
1600
1200
22
27

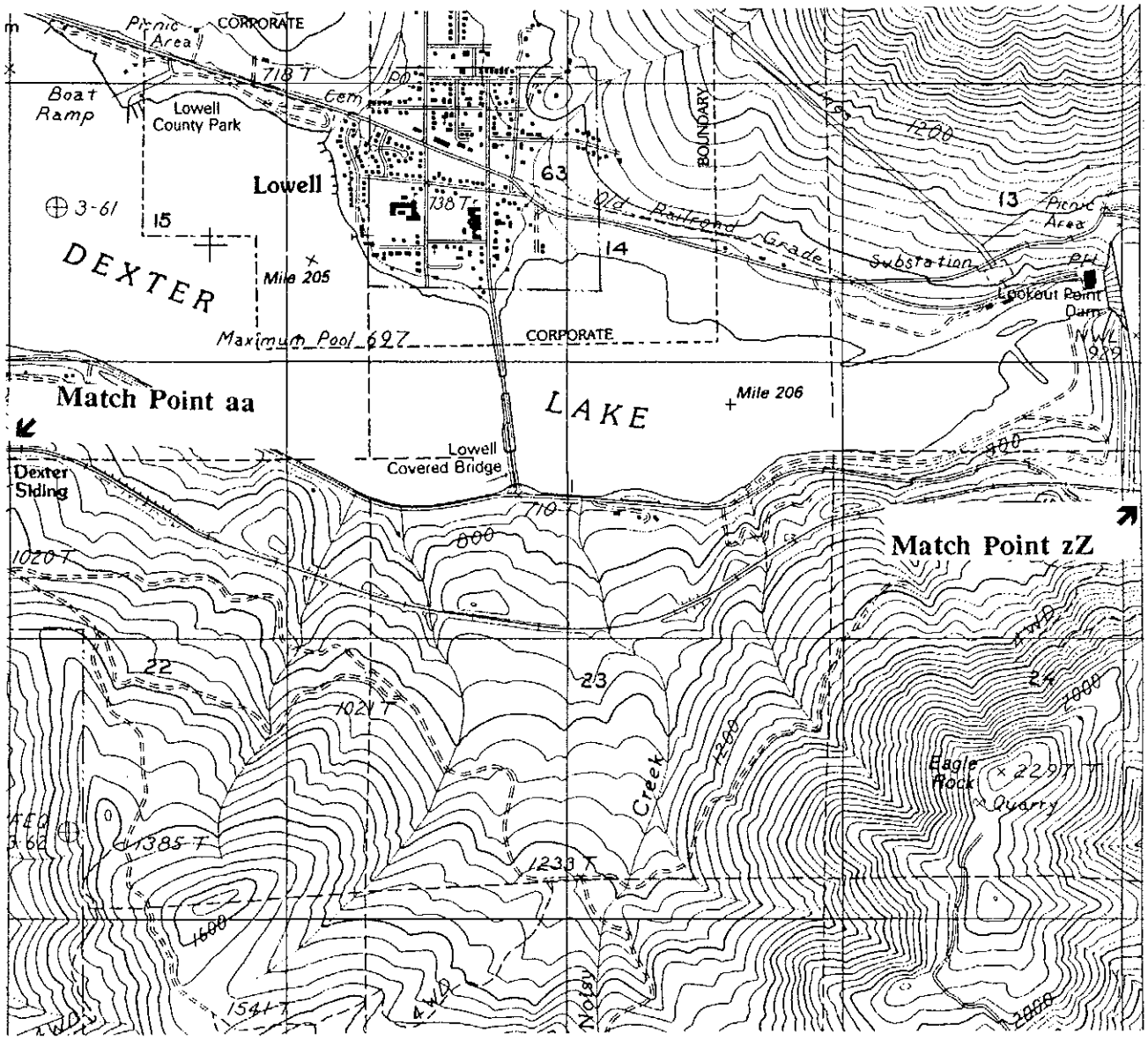

Mile 215
Match Point vV
LOOKOUT POINT LAKE
WL 929
Cain Creek
Armet
1400
1200
1800
2000
1600
1000
950T
1331T
641T
1688T
1839T
1929T
1771T
Creek
Hill
Carpet
Transportation
W
Hospital
South Creek
1251T
1198T
946T
Hampton
2TKS
3TKS
Picnic Area
Boat Ramp
Hampton Boating Site
7
8
17
18
19
20
Match Point uU

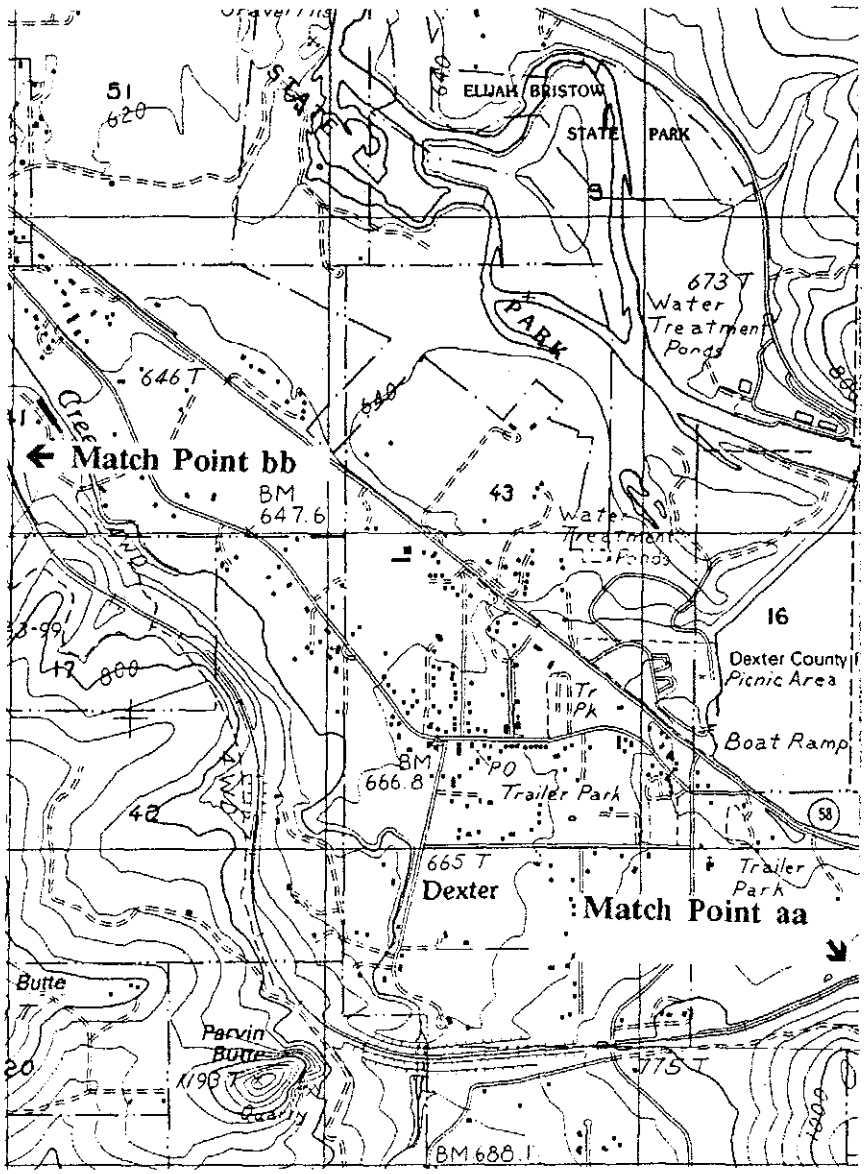

Match Point wW
Match Point vV
POINT LAKE
NWL 929
Mile 214
Crale
Crale 1009T
WT
1200
Crale
Creek
Creek
Creek
Line
5117
1400
2
11
12
7
13

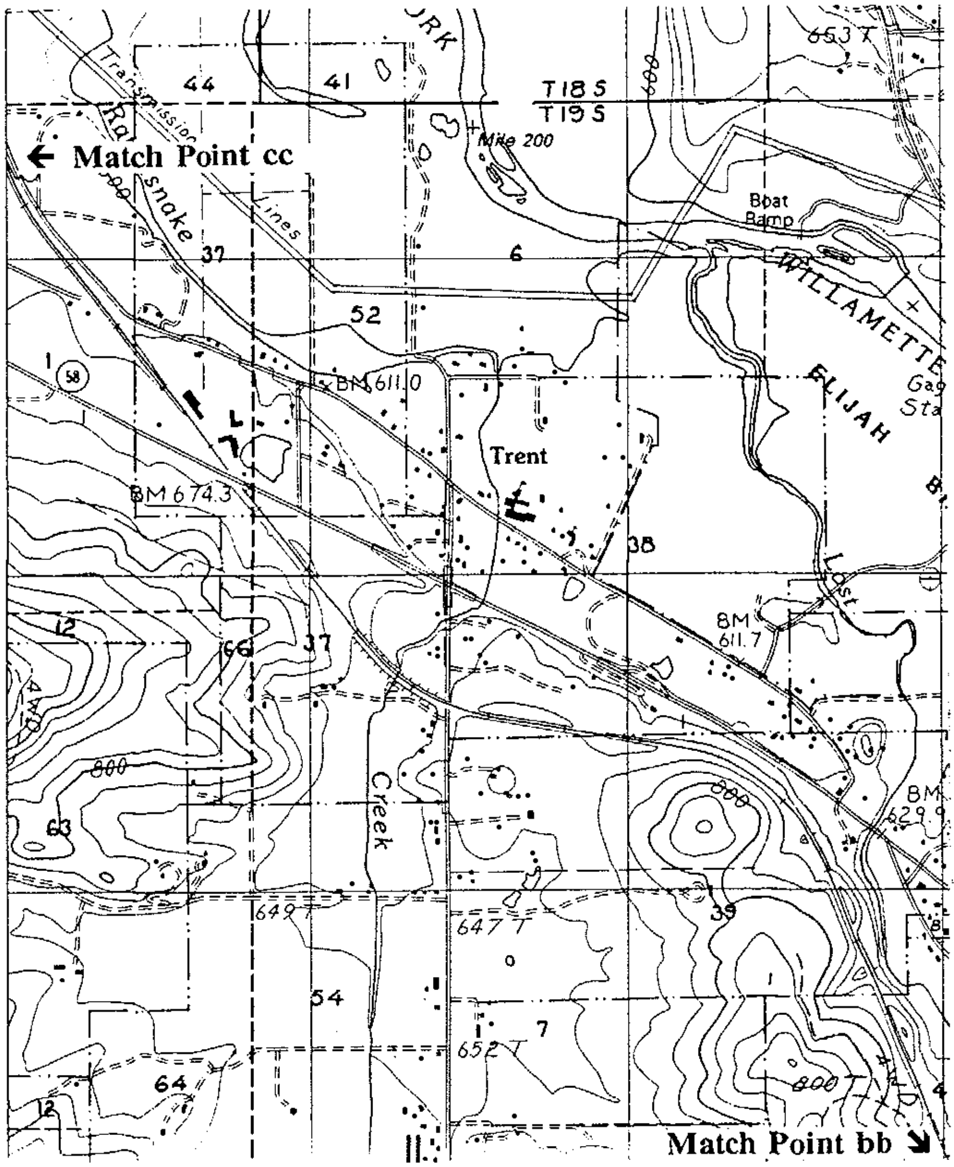

Match Point xX
34
Pinic Arca
Ivan Oal
County
Boat
Ramp
33
1435T
LOOKOUT
Mile
212
Creek
Hazel
4
1744T
Fern
Creek
3
Match Point wW
2030T
1600
1430T
9
10

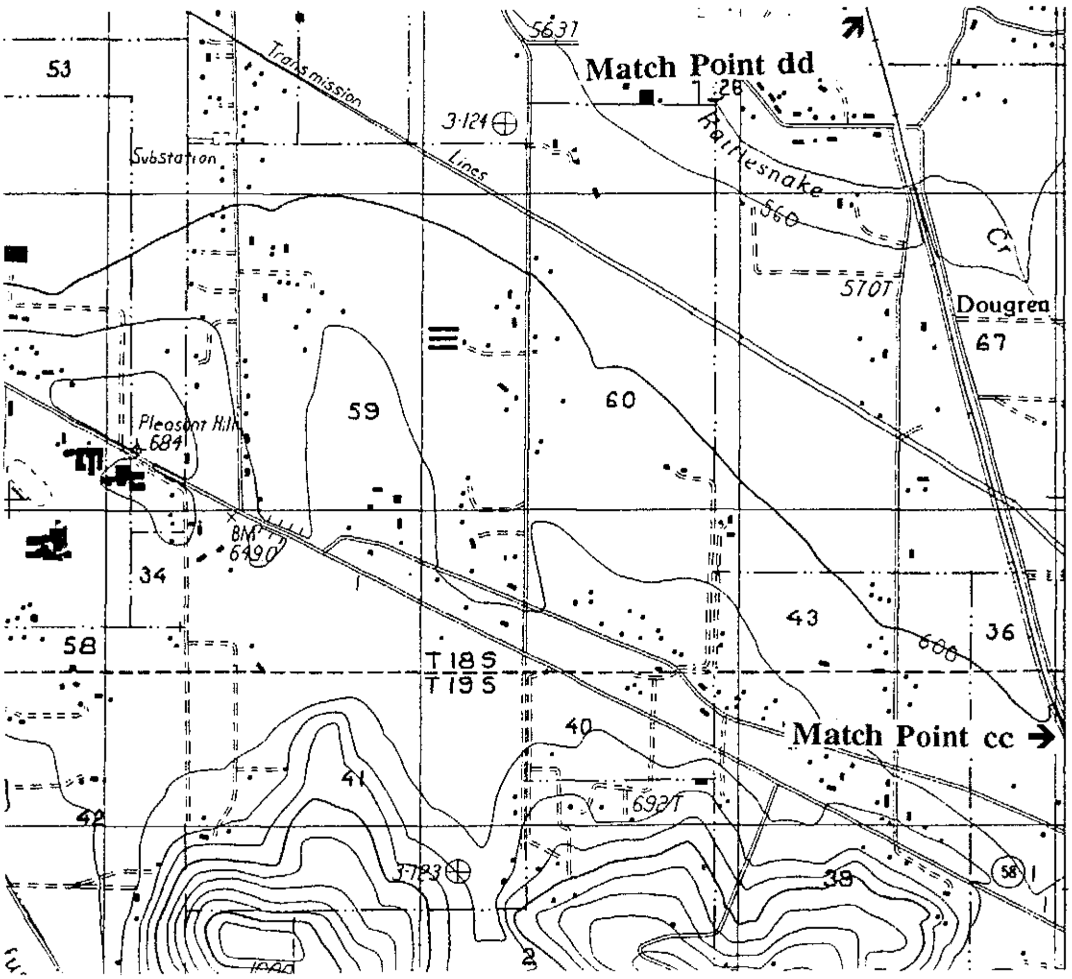

Wimble Pass
20
1200
Landax Landing County Park
Picnic Ar
Boat Ram
POINT
Match Point yY
29
28
LAKE
Mile 210
Match Point xX
32
1600
58

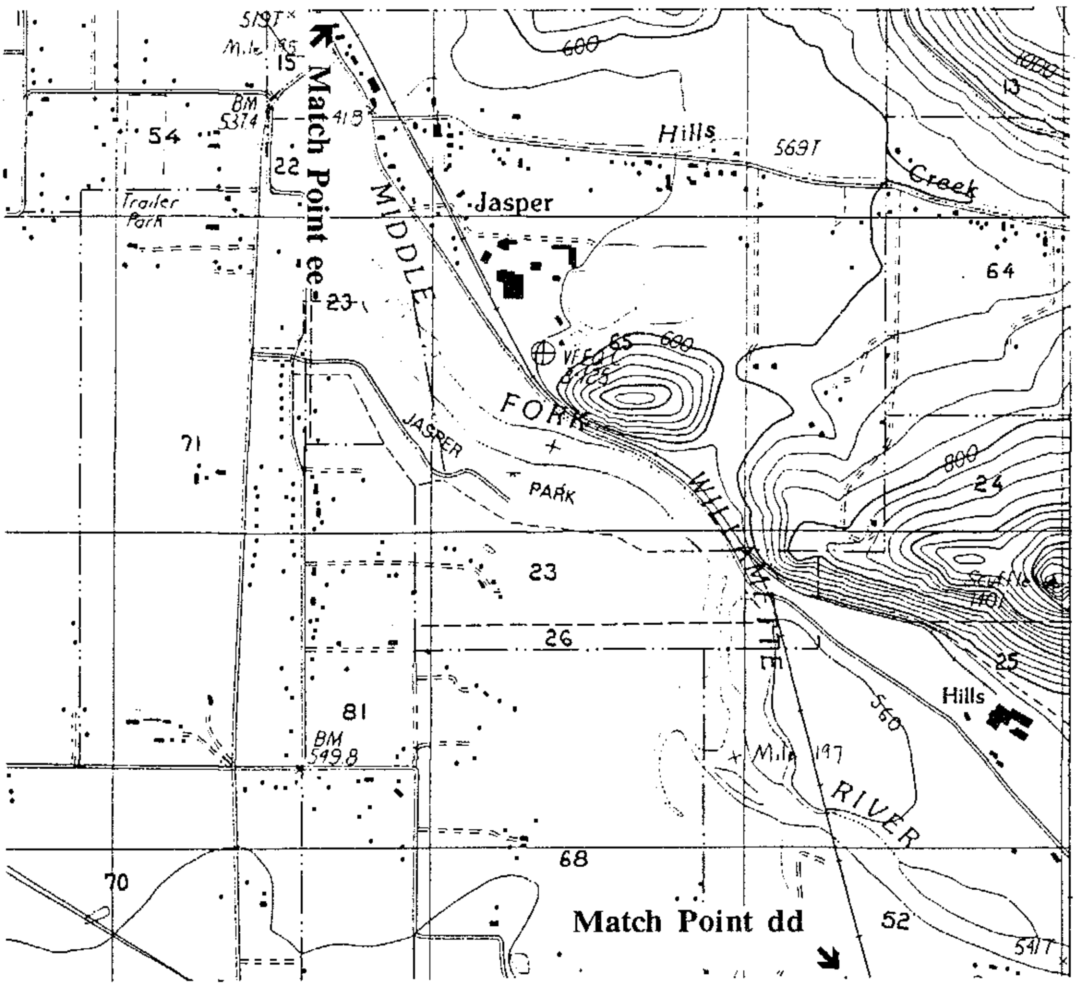

Match Point zZ
Minnow
LOOKOUT
19
Creek
Minnow
30
Match Point yY
Fork
East
1350T
1400
1200
25
36
31
MERIDIAN
WILLAMETTE
R1E
R1W
Quarry

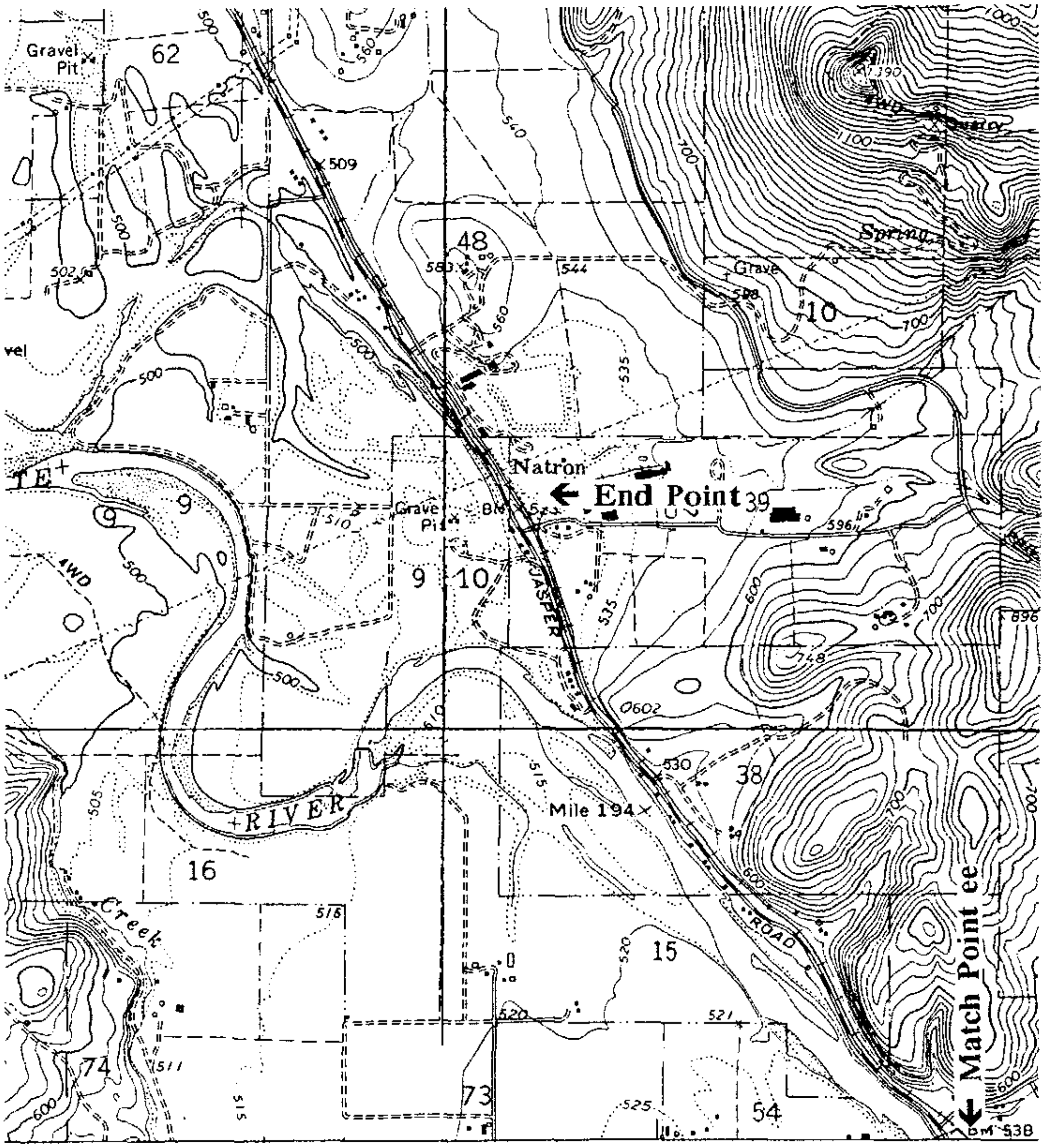

Picnic Area
CORPORATE
718 T
Boat Ramp
Lowell County Park
Cem
Lowell
738 T
BOUNDARY
1200
63
Old Railroad Grade
13
Picnic Area
3-61
15
14
DEXTER
Mile 205
Substation
Lookout Point Dam
Maximum Pool 627
CORPORATE
Match Point aa
LAKE
Mile 206
Lowell Covered Bridge
Dexter Siding
710 T
800
1020 T
Match Point zZ
22
23
1021 T
Creek
Eagle Rock Quarry
2200 T
1385 T
1233 T
1600
1541 T
Noisy
2000


ELIJAH BRISTOW
STATE PARK
673 T
Water Treatment Ponds
646 T
Match Point bb
BM 647.6
43
Water Treatment Ponds
16
Dexter County Picnic Area
Tr Pk
Boat Ramp
BM 666.8
PO
Trailer Park
42
665 T
Dexter
Trailer Park
Match Point aa
Butte
Parvin Butte
1190 T
775 T
BM 688.1


Match Point cc
Match Point bb
Transmission Lines
Rattlesnake
Creek
WILLAMETTE
ELIJAH
Trent
Boat Ramp
Lost
T18S
T19S
Mile 200
BM 611.0
BM 674.3
BM 611.7
653 T
649 T
647 T
652 T
800
44
41
37
6
52
1
58
38
12
66
37
63
39
54
7
64
12


Match Point dd
Match Point cc
Transmission Lines
Substation
Rattlesnake
Dougren
Pleasant Hill 684
T 18 S
T 19 S
53
59
60
67
34
58
43
36
40
41
42
39
560
570T
600
3124
3123
692T
5631
28
58


Match Point ee
Match Point dd
Jasper
MIDDLE
FORK
WILLAMETTE
RIVER
Hills
Creek
Trailer Park
JASPER PARK
BM 537.4
BM 549.8
600
800
1000
560
569T
541T
54
22
15
23
71
81
70
68
52
26
25
24
64
13
Hills


Gravel Pit
62
509
48
544
Natron
← End Point
39
596
9
10
JASPER
RIVER
Mile 194
38
16
Creek
ROAD
15
74
73
54
BM 538
Match Point ee
Spring